AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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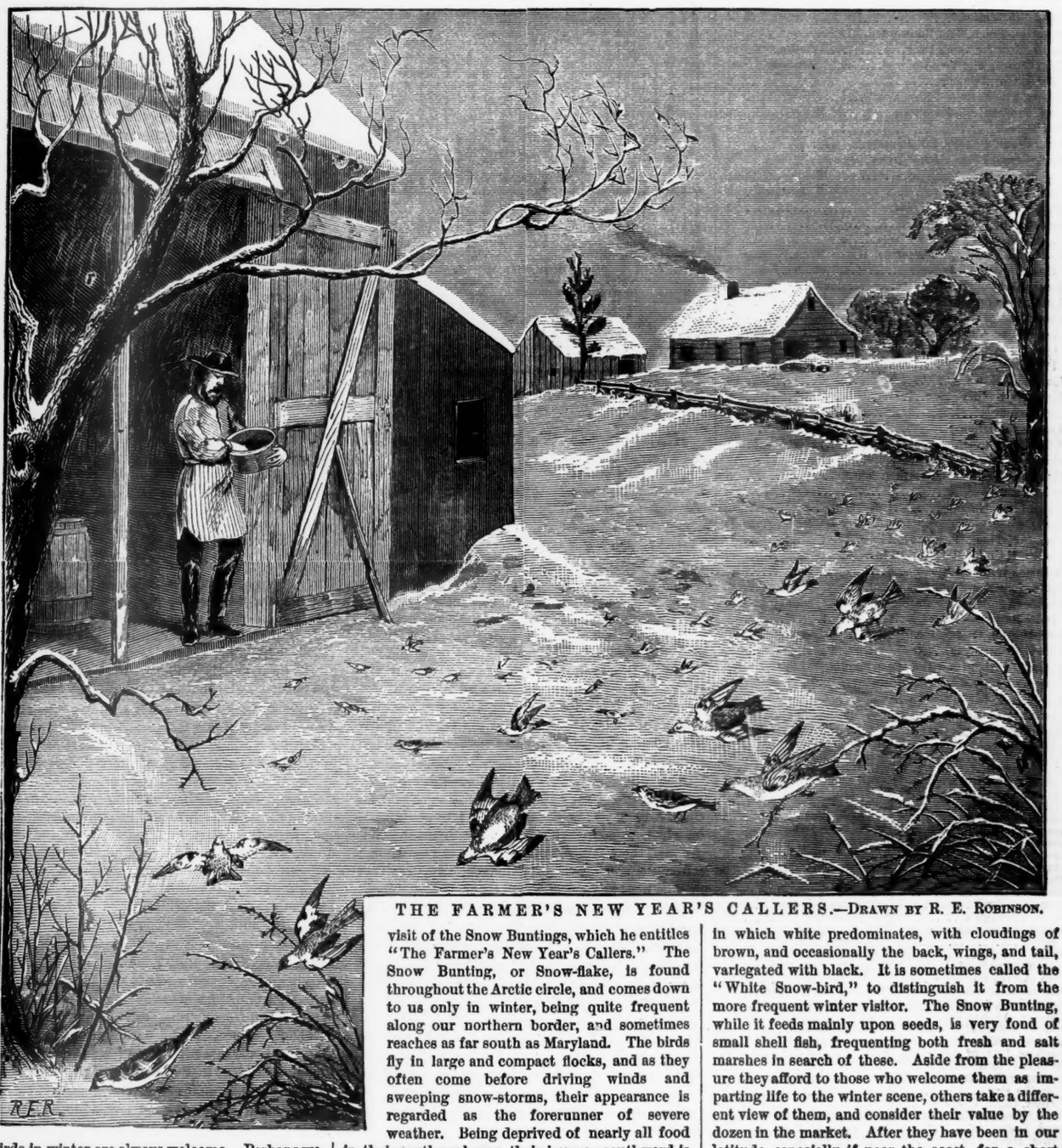

THE FARMER'S NEW YEAR'S CALLERS.—DRAWN BY R. E. ROBINSON.

Birds in winter are always welcome. Perhaps we notice them more readily when the whole landscape is covered with snow; their quick motions bring life to the profound quiet, and their chirpings seem like music in the noiseless winter morning. Even a few Chicadees and common Snow-birds are welcome, for their quick and pleasing motions, but when the north wind brings down a whole flock of Snow Buntings, then there is life in earnest. Our farmer artist, to whom we are indebted for many drawings of birds from life, gives us a view of a visit of the Snow Buntings, which he entitles "The Farmer's New Year's Callers." The Snow Bunting, or Snow-flake, is found throughout the Arctic circle, and comes down to us only in winter, being quite frequent along our northern border, and sometimes reaches as far south as Maryland. The birds fly in large and compact flocks, and as they often come before driving winds and sweeping snow-storms, their appearance is regarded as the forerunner of severe weather. Being deprived of nearly all food in their northern home, their journey southward is apparently one of necessity; they do not remain long at any place until they reach the vicinity of the sea-coast, where, in the salt marshes, they become very fat. Inland they appear to be very unsettled and impatient; they sometimes settle in large numbers near the house, alighting on fences and bushes, or in the yards and roads, actively seeking food. It is an act of kindness to do as our farmer is doing, and welcome the callers with a bit of cheer. The bird comes to us in its winter dress, in which white predominates, with cloudings of brown, and occasionally the back, wings, and tail, variegated with black. It is sometimes called the "White Snow-bird," to distinguish it from the more frequent winter visitor. The Snow Bunting, while it feeds mainly upon seeds, is very fond of small shell fish, frequenting both fresh and salt marshes in search of these. Aside from the pleasure they afford to those who welcome them as imparting life to the winter scene, others take a different view of them, and consider their value by the dozen in the market. After they have been in our latitude, especially if near the coast, for a short time, they become very fat, and are regarded as most delicate eating; they are often sold in our markets as "Ortolans." They often fly in such dense masses, that they are shot in great numbers; and many are also taken in traps. In Northern Europe the coming of these birds is a great event for the poorer classes, as it allows them to have a time of feasting. In some European countries they are caught and fattened for the table, and in far northern countries they are dried for future use.

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Calendar for January, 1880.

Day of Month.	Day of Week.	Boston, N. England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Mo'n rises.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Mo'n rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Mo'n rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	T	7 30	4 38	8 58	7 25	4 44	9 0	7 19	4 49	9 2
2	F	7 30	4 39	10 5	7 25	4 44	10 5	7 19	4 50	10 6
3	S	7 30	4 40	11 13	7 25	4 45	11 12	7 19	4 51	11 11
4	S	7 30	4 41	morn	7 25	4 46	morn	7 19	4 51	morn
5	M	7 30	4 42	0 23	7 25	4 47	0 21	7 19	4 52	0 19
6	T	7 30	4 43	1 36	7 25	4 48	1 33	7 19	4 53	1 29
7	W	7 30	4 44	2 52	7 25	4 49	2 47	7 19	4 54	2 42
8	T	7 29	4 45	4 7	7 24	4 50	4 1	7 19	4 55	3 56
9	F	7 29	4 46	5 19	7 24	4 51	5 13	7 19	4 56	5 6
10	S	7 29	4 47	6 22	7 24	4 52	6 14	7 19	4 57	6 9
11	S	7 29	4 48	sets	7 24	4 53	sets	7 19	4 58	sets
12	M	7 28	4 49	5 58	7 23	4 54	6 1	7 18	4 59	6 6
13	T	7 28	4 50	7 12	7 23	4 55	7 15	7 18	5 0	7 18
14	W	7 27	4 52	8 24	7 23	4 56	8 25	7 18	5 1	8 26
15	T	7 27	4 53	9 32	7 22	4 57	9 31	7 17	5 2	9 32
16	F	7 27	4 54	10 37	7 22	4 59	10 36	7 17	5 3	10 35
17	S	7 26	4 55	11 41	7 21	5 0	11 38	7 17	5 4	11 36
18	S	7 25	4 56	morn	7 21	5 1	morn	7 16	5 6	morn
19	M	7 25	4 58	0 43	7 20	5 2	0 40	7 16	5 7	0 37
20	T	7 24	4 59	1 46	7 20	5 3	1 41	7 15	5 8	1 36
21	W	7 23	5 0	2 47	7 19	5 4	2 41	7 15	5 9	2 35
22	T	7 23	5 1	3 45	7 19	5 6	3 38	7 14	5 10	3 32
23	F	7 22	5 3	4 39	7 18	5 7	4 32	7 13	5 11	4 26
24	S	7 21	5 4	5 27	7 17	5 8	5 20	7 13	5 12	5 15
25	S	7 20	5 5	6 9	7 16	5 9	6 3	7 12	5 13	5 58
26	M	7 20	5 6	6 45	7 15	5 10	6 40	7 11	5 15	6 36
27	T	7 19	5 8	rises	7 15	5 12	rises	7 11	5 16	rises
28	W	7 18	5 9	6 49	7 14	5 13	6 51	7 10	5 17	6 53
29	T	7 17	5 10	7 57	7 13	5 14	7 57	7 9	5 18	7 58
30	F	7 16	5 11	9 5	7 12	5 15	9 4	7 8	5 19	9 4
31	S	7 15	5 13	10 14	7 11	5 17	10 12	7 7	5 20	10 11

PHASES OF THE MOON.

MOON.	D.	BOSTON. H. M.	N. YORK. H. M.	WASH'N. H. M.	CHA'STON H. M.	CHICAGO. H. M.
3d Quart.	5	2 5 mo.	1 53 mo.	1 41 mo	1 29 mo.	0 59 mo.
New M'n	11	5 56 ev.	5 44 ev.	5 32 ev.	5 20 ev.	4 50 ev.
1st Quart	19	1 56 mo.	1 44 mo.	1 32 mo	1 20 mo.	0 50 mo.
Full M'n	27	5 28 mo.	5 16 mo.	5 4 mo	4 52 mo.	4 22 mo.

NEW YORK, JANUARY, 1880.

Hints for the Work of the Month.

[*The Hints and Suggestions in these columns are never copied from previous years, but are freshly prepared for every month, from the latest experience and observations, by practical men in each department.*]

How do You Stand?—One cannot lay out his work to advantage, without knowing precisely how he stands with regard to his business. The beginning of the year is the appropriate time for ascertaining it. Frequently an account of business is kept for a month or two, and then neglected. If it is only to encourage habits of regularity and perseverance, it will be time well spent to keep an account, not only of money affairs, but a record of events for every day. This tends to beget promptness and system in every detail of farm work, and in business affairs, that foresight and economy which are everywhere the prime essentials to success.

Keep a Record of the events of each day's work, and farm-life. One of the boys or girls should do this. A book will be needed, ruled with plain lines, on which to make the entries; put down the condition of the weather, the work done, and by whom; purchases and sales made, indeed, anything that may be needed for future reference, or that should be entered in the account book, which will thus become a valuable and interesting record of the farm.

Make an Inventory:—Put down every thing you possess, from the farm itself, to the small tools and utensils, and value each item fairly. Enter the money on hand, and also every debt owed. This is the first work in beginning an account. The property owned, and money on hand, will be on one side of the account, and the debts on the other. The balance will show just how the farmer stands. This account will be the *Account of Stock.*

Purchases and Sales, are entered in the daily record, and from that into a purchase and sale book; except the cash transactions, which go into the cash book.

The Cash Book.—Every payment and receipt of money for purchases, sales, or for wages, should be entered in the cash book; this should be done every evening, and before it is forgotten; all these entries are transferred to a ledger to the proper accounts. The work is very simple and easy, and there are farmer's girls who keep all their father's accounts in the most accurate manner. Fuller directions for keeping farm accounts, were given in the *American Agriculturist* for January and February, 1879.

Hiring Men.—A farmer should try to make work for a hired man, or several if possible. If he can find profitable work for them, he is making money for himself. A few months wages spent in procuring or making manure, draining, clearing off stone, getting out stumps, or otherwise making the farm more productive, will be well invested.

Keep the Stables Clean; clear out the manure every morning, and scrape or card off all filth from the animals. The stable should be made so warm, that the manure will not freeze at night; a lower temperature will either demand a larger amount of food, or the animals will fall off in condition.

Pile the Manure in square and compact heaps; and if it is not frozen when thrown out, it will heat and ferment in the pile; but if once frozen, it will be likely to remain so during all the cold weather.

In the Southern States, the work of making compost heaps, should go on rapidly this month. Time is needed in making composts; raw mixtures are not fit for fertilizers, until the materials are decomposed. A bushel of lime added to each load, will hasten the decay of the materials of the compost heap, and cotton seed, well soaked with water, will soon heat, and warm up a large pile of compost.

Cut the Litter.—If the litter is cut into 3-inch lengths, or even smaller, it will hold more moisture, will make better and finer manure, and will keep the animals cleaner than long litter. The gain in the quality of the manure, in one year, the saving in time in the handling, and increased effectiveness of it, will pay good interest on the cost of a windmill, and a fodder cutter, to do the cutting. But if the stormy and disagreeable days are chosen to cut up straw for this purpose, an abundant supply can be made. A broad axe can be purchased for $2.50, and with this and a block, a sheaf of straw may be cut into 3-inch chaff, in half a minute. Two persons, one to hold the sheaf on the block or plank, and the other to use the axe, would soon cut up a ton of straw. Where hard-wood saw-dust, dry swamp muck, or pine straw can be procured, these make excellent litter and manure.

Economy in Feeding, is a very important consideration. In some cases half the feed used is wasted. Cutting the fodder has proved a saving of one-third to one-half. Where but 10 head of stock are fed, if the feed of one-third or one-half can be saved, it is simply a large increase of the resources of the farm, and is sufficient to pay the cost of a good cutter and the time expended in cutting.

Watering Stock.—The supply of water in winter is a source of trouble. Ice gathers about the troughs and other drinking places; pipes freeze and burst, or become choked, and many other inconveniences occur. These may be avoided by methodical management. Have regular watering periods, twice a day. Fill the troughs from the pumps or cisterns, and drive the cattle to them and see that they drink. When all are supplied, empty the troughs, and either cover them or turn them over. Have no flowing water in the yards to waste and freeze, or become ice-cold for drinking. A cold drink will reduce the milk from the cows 10 per cent or more.

The Milk-Room or Spring-House.—Frozen cream will not make good butter. To prevent milk from freezing, have a small stove in the dairy, and in the spring-house make a covered box over the spring. Where a run from a spring can be brought in pipes, a Cooley creamery can be used during the winter with great advantage; keeping an even temperature equal to that in the summer when ice is used.

Horses.—When not at work the horses need but little grain, if sufficient good hay is given. But as hay is generally dusty, and long hay is wasted in the eating, we find it economical to cut and wet the fodder, and give 3 quarts daily of bran or ground feed. The hay saved will pay for the meal, and the increased value of the manure will pay for the labor. The moist feed prevents injury to the horses from breathing the dust from dry hay.

Mares in Foal.—A roomy loose box is the safest and most comfortable place for a brood mare. A colt may be raised for the same cost as a cow, and when 3 years old may be worth four cows. There

is a brisk demand for good work horses, and a large export business is growing up, so that the keeping of mares will become a source of income. But not only must the right kind be kept, and the right kind of colts be raised, but the mares must have proper stable accommodations. When a mare is idle a large portion of the time, exercise is needed, and this she can get in a loose box.

Colts.—Young colts should be well fed and cared for the first winter; provide a warm stall for them, with plenty of litter, and give them a good brushing down once every day. A quart of oats, daily, will be needed, and some bright, clean, sweet hay. Cut-feed is not suitable for young colts, whose digestion should not be overtaxed by food packed solidly in the stomach; feed light and frequently.

Work Oxen.—Oxen that work on frozen roads, although there is no ice, should be shod. The rough, hard surface wears down the hoofs very fast, and causes inflammation of the interior; the trouble may not become apparent until later, when the mischief is difficult to repair. If the feet are tender and hot, and slight lameness is perceived, examine the hoofs between the claws, cleanse the feet, and apply remedies if needed.

Cows.—Milking cows will be benefited by mixing their feed with warm water, if this can be done without too much trouble. A family cow may be treated to a warm mess in the mornings without difficulty, and it will increase the milk perceptibly. Cut the hay and pour a pailful of hot water over it; mix the mess so that the hay is all wetted, and add the meal; mix again, and feed while warm. In a dairy of 20 cows, the extra milk will pay for the labor needed. If the food can be made more digestible, and by giving it warm, the waste of animal heat will be avoided, and the same effect will result as from an increase of food. Thus the study of the principles of feeding may be made a source of profit by the economy which may be practised through it. The card and brush should be in frequent use during the winter, and if necessary a coarse cloth and warm water may be used to preserve cleanliness. If filth is permitted to gather on the skin it is difficult to remove at this season.

Young Calves will thrive well if kept in a shed together and well fed. The shed may be littered liberally, and need not be cleaned out until the spring, or until the manure has become a foot or more deep. Calves may thus become good manure-makers, but it will be necessary to feed them well. Bran and oats, with a little corn, will be the best food for them. Give one pint a day for those under a year, and a quart or two daily for yearlings. Costiveness in cold weather should be carefully guarded against, and, if necessary, half a pint of raw linseed-oil, or a pint of linseed-meal, should be given with the food as a remedy.

Sheep.—A flock of sheep may be made the most profitable of farm stock, both in return of money and of manure. By feeding a small flock well, through the winter, their value may be easily doubled. But the feeding should be liberal and the care unremitting. The chief requisites for success with sheep are, to provide abundant good food and pure *well* water; to feed and water regularly; to provide fresh pure air, and to avoid dampness. When feeding sheep for market, it is well to try the weights every second week, and note the increase. (For a method of weighing, see *American Agriculturist* for Dec., 1879, page 500.) The effects of the feeding can thus be readily ascertained and changes made if it is thought necessary.

Breeding Ewes that are expected to drop lambs early, should be closely watched. The springing of the udder is an unfailing sign of approaching parturition. The ewe should then be removed to a separate pen and kept quiet, but visited at least every three hours and the last thing at night. It is rarely that any help is needed, except, in very cold weather, to wrap a piece of soft blanket about the lamb and to help it to suck as soon as possible. As soon as the lamb gets a meal it will be all right, and the ewe may be left to herself for a few hours.

Tameness and Gentleness are qualities to be encouraged in all domestic animals. Their value is discovered when it is necessary to handle the animals at critical periods. When confidence, if not affection, exists, one can do much with a suffering animal, when otherwise interference might make matters worse. It would be well to make friends with cows, and sheep, especially, by petting them, giving them salt and palatable things, and mingling with them in the yards. Every animal should be trained to be handled when loose in the yard.

Lambs.—Lambs dropped this month should be well fed through the ewe. Give little heating food, such as corn, in any shape; but bran, oil-cake meal, and oatmeal in gruel, will be healthful and nourishing for the ewe and the lamb. In stormy weather the ewe and lamb may be kept under cover, but in fine, sunny days, they may run in a dry yard; but not with other sheep. Early lambs for market should be pushed ahead as fast as may be safe.

Pigs.—Store pigs will thrive well on roots with a slop of bran, sour milk and water. A supply of roots on hand will greatly reduce the cost of feeding store pigs. Turnips that can not well be fed to cows may be given to the pigs. Give young pigs a warm dry bed.

Lice.—The irritation of lice keeps young animals poor and miserable. To rid them of these pests, brush the skin all over thoroughly with a brush dipped in a mixture of linseed-oil and kerosene, shaking the excess of oil out before using the brush. Work the grease down to the skin; if this is persevered in the lice will soon disappear.

Poultry.—Hens and early pullets will now be laying freely. They should be encouraged by giving them warm food. Baked small potatoes taken direct from the oven, and hot, are much relished by the fowls; scalded corn-meal, corn or wheat parched in the oven, crusts of bread, or oatmeal, steeped in hot milk; and meat scraps, with some stimulating condiment, like Cayenne pepper, will be found to add greatly to the store of eggs all through the stormiest weather; but the fowls must have a dry, warm, clean, sheltered place to roost and lay in.

Ice.—Get in a supply of ice as early as possible. A stock in the house is worth two in the pond. A supply has often been missed by waiting one day too long. When ice is 6 or 8 inches thick, it should be cut and stored without delay. See article on Ice-houses in *American Agriculturist* for Dec., 1879.

Notes on Orchard and Garden Work.

The opening of a new year brings many new readers, and a word to these is here in place. It should be understood that these Notes are not written for the professional horticulturist, or commercial nurseryman; though they may contain valuable information for these, still it is taken for granted that they already possess the necessary knowledge to their business, or can find it in the works belonging to their profession. It is for the amateur that these Notes are written, and by "amateur," we mean every one who does not follow orcharding, or gardening in any of its forms, as an occupation. Farmers as well as others are to be classed as amateurs in these matters, and these Notes are made largely with the view of encouraging farmers in these branches of land culture, and to aid them when they undertake any kind of crops outside of those belonging to the farm proper.

Whoever undertakes an orchard, or fruit growing of any kind, or who has a vegetable garden, or would decorate his grounds with shrubs and flowers, should have at hand a work for reference. To be able to learn a fact, or to remedy a difficulty at once is of great value, and a book will often more than pay for itself in a single reference We give in the Basket some hints as to the contents of the leading works.

No time is so proper for useful reading as the comparatively leisure days and evenings of winter! It is a foregone conclusion that success cannot be attained in any department of human life without *work*, and the conclusion is equally clear that the work of the muscles, to be most efficient, must be guided by intelligence; the mind and the hand must labor together to bring about the greatest good.

Orchard and Nursery.

An Old Orchard is as unproductive as it is unsightly, and to one who really loves a tree, many of the orchards one sees in going about the older portions of the country, present melancholy examples of "cruelty to trees." The cause of the present condition of these trees is, partially neglect; mainly robbery. The trees could hardly been brought to their present condition had not the land for these many years been made to bear two crops. The act of planting an orchard is a promise that the trees should be fed. From the very first year these trees have had a yearly crop of grain or hay taken away from their land, except on those where the grass has been taken away by the animals pastured in the orchard. No question is more frequently asked us than

How to Renovate an Old Orchard?—There is a "previous question" in this case—"is the orchard worth renovating?" should be first considered. This can not be properly decided by one who has not seen the trees. When trees are very old and badly decayed, with trunks and larger branches more or less hollow, it is not worth while to expend labor upon them; the wood-pile needs them. But if merely badly shaped, and, though sound, are unfruitful, it will generally be a profitable investment to restore them. The

What to Do, will vary with circumstances. Often putting down a few rows of drain tiles, with the necessary pruning, will be all that is needed to overcome the original mistake of the planter, who set his trees on land not good enough for the usual farm crops. Many of the bad orchards never could have been good with any above-ground care. If the soil was good, the now suffering trees have been starved. The great want is food; supply it by

Manuring the Soil.—Such orchards generally are in grass. Spread a heavy coat of manure over the whole surface, and turn over the sod in the spring. When the sod has decayed, then give a deep plowing, and spread ashes if they can be obtained, or a good dressing of lime, and harrow. Thus far we have attended to the roots. The above-ground portions need care. The trunk and larger branches are usually covered by scales of old bark, growing upon which are mosses and lichens, and hidden beneath them the eggs and chrysalids of insects.

Scraping the Bark with a short-handled hoe will remove a portion, but to make a complete job, use strong home-made soft soap, made from ley or potash. Thin this with enough water to apply readily to the bark, and leave the rain to do the rest. Do this work of scraping, etc., early in the spring.

Pruning will generally, if not always, be needed. How, and how much, will depend upon the state of each tree. Endeavor to open the tree to let in light and air all through it, and also to bring the head to a well balanced shape. It may require the removal of some large branches and the shortening back of others. This may be done at the end of winter; cover all large wounds with some dark-colored paint. If large ragged wounds have been made by the breaking down of branches, dress the cut by the use of a drawing knife or stout chisel, to make a clean, smooth wound and paint it. We have assumed that the variety of fruit is good. If the tree is sound, but of a worthless variety, renew it by

Grafting.—The manner of renewing an old tree by grafting it over to make a new head, must be left until next month's Notes.

Planting Orchards.—One contemplating planting an orchard, should first determine to do well by the trees, by giving them the first and sole right to the ground. An orchard poorly kept is a bad investment. Next, use great care in selecting the varieties of fruit. Do not make too long a list.

Varieties of Apples.—A dozen varieties is ample, and may be thus divided; two early, four autumn, and six winter kinds. Of course the number in each division will be governed somewhat by individual taste, and whether the fruit is solely for home use or for market. It is difficult to give a list of varieties that will suit all persons and all localities. The following may be of some aid to

those about to make a selection. *Early*—Red Astrachan, Early Harvest, Golden Sweet, Williams' Favorite. *Autumn*—Gravenstein, Porter, Maiden's Blush, Duchess of Oldenburg. *Winter*—Rhode Island Greening, Red Canada, Golden Russet, Ben Davis, Northern Spy.

Varieties of Pears.—For orchard planting, the list may be: for *Early*—Doyenne d'Eté, Manning's Elizabeth. *Summer*—Bartlett, Clapp's Favorite, Beurre Giffard. *Autumn*—Beurre Hardy, Doyenne Boussock, Seckel, Duchesse d'Angouleme, Belle Lucrative. *Winter*—Winter Nelis, Lawrence, Vicar of Winkfield, Dana's Hovey.

Peaches.—In every peach region, the selections for market vary with each locality. The following is a good selection for home use: Early York, Early Crawford, Old Mixon Free, and Smock.

Cherries.—Early Richmond, Black Tartarian, Coe's Transparent, are the leading varieties.

Quinces are often put in some out of the way, low, wet place, and they often give fair fruit in spite of it; they should have as good soil and culture as any fruit, and when thus treated, few fruits are more profitable. The old Apple or Orange Quince is best known, and good. Rea's Seedling is very fine, and a new Connecticut variety, Champion, gives high promise.

Purchasing.—By all means purchase of reliable nurserymen, that you may be sure of good stock, and trees true to name. Other things being equal, it is best to buy as near home as possible, as there is less danger of injury in transportation.

Insects.—The clusters of eggs of the Tent Caterpillar are most conspicuous now, and should be found and destroyed. They are always glued in a band near the ends of the small twigs, and are best seen in dull weather.

Protection.—Young trees must be secured against the attacks of rabbits by smearing the trunks with blood, or by placing common laths around the trunk, and fastening them in place with wire. In deep snows, mice may work beneath the surface, and gnaw the bark—to prevent this, tread the snow down firmly about the trunk.

Manure may be drawn out and spread in the orchard at any time. When the snow is on the ground a sled can be used with advantage, being lower than a wagon, and passing more easily under the trees.

The Fruit Garden.

For the benefit of the new readers, it may be said that under the "Fruit Garden," we include what are generally known as *small fruits*—the various berries, grapes, dwarf pears, etc. The fruit garden ought to be a reality on every farm, large or small, for the enjoyment it gives, and the health, and even profit which it brings when well cared for—giving a succession of delicious fruits from the time strawberries come until the late grapes are gone. It is an unpleasant fact that the fruit garden is much neglected on many farms. With the good resolutions of the new year, we hope that many will resolve to set apart a portion of ground to be devoted to the culture of small fruits.

Soil.—The soil of the fruit garden should be rich and well drained, that it may be loose and allow of a free circulation of air, and not permit water to stand upon or below the surface.

Manure of the best quality should be used.

Strawberries.—The list is so large that a novice is bewildered in making a selection: Charles Downing, Seth Boyden, Monarch of the West, Duchesse, Forest Rose, and Sharpless, are all good. On heavy soils the old Triomphe de Gand and Jucunda.

Raspberries.—Brandywine, Cuthbert, Herstine. *Black Caps*—Amer. Improved, Mammoth Cluster.

Gooseberries.—Downing, Houghton.

Currants.—Versailles, White Grape, Red Dutch.

Blackberries.—Kittatinny, Snyder, are the best.

Grapes.—Concord, Wilder, Delaware, Brighton, Telegraph; Iona and Catawba, where they succeed.

Kitchen and Market Garden.

This is a department of the *household* and the *farm*—falling under the two heads and joining them closely together. As is the Kitchen Garden, so is the dinner; and as the dinner, so the health, the disposition, and the general comfort of the household. Aside from the needs of the family table, Kitchen Gardening, in many localities, may be made to pay. If a person is living near a manufacturing town, many things, like cabbages, turnips, green corn, peas, etc., may often be grown and sold with satisfying profit. There are many cases where persons thus engaged have realized greater returns from the garden than from the whole farm. There is nothing *small* in growing peas or cabbages, if they pay better than field corn or wheat. It will pay in many cases to look closely into this matter. It must be borne in mind that, as a general thing, the products of the garden are perishable, and the first condition of success is a near market.

Manure is the foundation of good gardening; it is the food out of which plants, as factories, and the sunshine as the force, make the good things for the table. During the winter all the manure, and of the best quality, that is possible, should be made and *saved*. It is one thing to make manure, and another to save it. Be sure and do *both*.

Leaves may be collected at any time during the winter when the ground is clear of snow. They make the best of litter, and act as an absorbent of liquid manure, while they are rich themselves.

Cold Frames.—It is to be remembered that the plants in the cold frames should not be kept so warm that they start into growth. If such is the case, when a cold snap comes, the young growth is killed down, and the plants ruined. When the temperature is above 30° the sashes should be raised.

Hot-beds will be started in the Southern States during this month. At the north the sashes, etc., should be put in order so that everything may be in readiness when the hurrying time of spring comes.

Roots put away in trenches will need some additional covering as the cold increases.

Seeds should be looked over and a list of those wanted made out and sent to the seedsmen. Order early, and thereby get the better attention.

Implements.—See that they are put in good order.

Flower Garden and Lawn.

The work here will be mostly in preventing injury to the trees and shrubs from heavy snows, and the lawn from being trespassed upon by careless drivers. Evergreens will catch a great amount of snow and bend and break beneath the weight if not relieved; it is best to shake off the snow soon after it falls, while it is loose and light. If the snow is deep, it may be necessary to dig it away from the long, lower limbs of large evergreens. That all persons driving into the grounds in winter may keep in the drives, a number of poles may be set along the roads, and if this is not thought sufficient, a wire may be stretched between them. It is a difficult matter for "fast" people to keep in the right path just after a heavy snow has fallen. The adornment of the surroundings of the house is a subject that most of us will do well to consider. Plan now for new walks and drives. Consider the planting and select the shrubs, herbaceous plants, the flower seeds for annuals, and order early.

Greenhouse and Window Plants.

This is the season when in-door plants should be showing at their best, and it is the holiday season for the greenhouse, when all without seems lifeless.

Bulbs for forcing should be brought out from the cellar, and watered sparingly until they start into new growth.

Annuals.—Sow seeds of Candytuft, Sweet Alyssum, Mignonette, and other annuals, for later blooming.

Insects, living as they do upon the juices of the plants, are a constant source of injury if not at once removed. The Red Spider may be kept off by thoroughly drenching the foliage, especially on the under surfaces, with water once a week or so. House plants, especially, suffer from the Red Spider, and also from accumulated dust, because their owners think they need "syringing," as usually directed, and this they know is not practicable in the dwelling room. Syringing is a quick and convenient method of washing the plants, but by no means the only one. Take the plants to the bath-tub, lay the pot carefully on its side, and then use the watering-pot, holding it high, so that the fine streams will descend with force, and so direct them that they will strike the undersides of the leaves. Set the plants upright, and let them finish dripping before taking them back to their places. If the bath-tub is not at hand, the kitchen-sink will answer as well. The Mealy Bug and Scale may be removed by hand-picking, or by the use of a brush and strong soap-suds. A wash of Tobacco Water is most effectual with the lice, or Green Fly; fumigation with tobacco smoke is used in greenhouses, and allows of wholesale application; this is not so practicable in the house, and tobacco water diligently applied answers as well.

Worms in the pots are often a source of serious trouble, but can be removed by turning the ball of earth out of the pot, when the worms will generally be found upon the surface of the ball and may be caught. If *clear* lime-water, enough to saturate the earth, be applied, it will kill the worms, and not injure the plants. An hour or so after applying the lime-water, water abundantly with common water.

Watering.—The soil should be kept moist and loose, that there may be a good circulation of air, not alternately soaking wet and powdery dry.

Window Plants should have special care when severe weather comes; take them from the window to the middle of the room, and cover with a sheet or other cloth, or with paper during the night.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

Too Important to be Overlooked.—While most of the Premium Articles offered by the Publishers are desirable, there is one proposition that demands careful consideration and action, on account of its far-reaching public benefits. We refer to the arrangement for supplying a Circulating Library of few or many Books, agricultural, horticultural, on animals, etc., including also many of the best Standard Works on other subjects. The details of the plan are simply as follows:

Any ten or more persons, even up to a hundred or more, in any neighborhood or town, can, by uniting and contributing $1.50 *a piece, not only secure the American Agriculturist for each person during* 1880, *but also as many Dollars' Worth of Books as there are members in the Club or Association. These books, put in charge of one of the members, from time to time, can circulate from one to another until all have read them, and then be kept as a library for reference by all interested. It only needs some enterprising public-spirited person in every town or neighborhood to secure a large valuable collection of books for general use.*

Even where there are a large number of subscribers already for 1880, *there are still remaining enough others to secure quite a library. Of course any person desiring can himself collect the subscriptions, and secure the books as his personal property. Many have done this. It is desirable, however, in this way, to secure a library for public use.*

For any School, Public or Private, there is not the slightest doubt that a most valuable and useful acquisition would be a good COMPOUND MICROSCOPE. The wonderful revelations of this instrument would awaken great interest on the part of both teachers and pupils, give them a new, now unseen, world of objects to think about, and be very useful in many ways. The high cost and delicate machinery of good instruments of this kind have placed them out of the reach of most ordinary Schools hitherto. The new, most valuable and effective Compound Microscope devised and brought out the past year, and supplied at less than a quarter of the cost of any equally serviceable instrument previously available, puts it within the reach of every school. Several Boards of Public School Trustees have already appropriated the $10 and purchased one—all others would be warranted in so doing. But it can easily be obtained

by the Teacher or some of the pupils, by getting the sum in subscriptions of 10 cents to $1 among the patrons. (In most districts, if the patrons of the school were aware of its usefulness, there would be found ten who would contribute $1.50 each, which would not only secure the Compound Microscope for the School, but also the *American Agriculturist* during 1880, for *each* one subscribing $1.50. Or the teacher might collect the subscriptions and receive the instrument himself or herself.)

The Premiums

All Available to Every One

This Month.

Every Reader is invited to look over the grand list of Premiums, including no less than **358** desirable articles of various kinds, besides **847** choice Books, which include many Standard Works from the leading Publishers. (If any one has not received the Descriptive Premium Sheet, or has it not at hand, he will be supplied by sending a Postal Card request for it.) The Articles and Books offered were secured early last year, before the great rise in prices, and so far as they are exclusively for Premiums, the Publishers' contracts hold good during the continuance of the present Premium List. The Premiums range all the way from small articles for sending single *new* subscriptions, up to $150 articles, and every person can secure some one or more of them now. We believe the present number of this Journal, if shown to non-subscribers as an earnest of what the Volume for 1880 is to be, will prove attractive enough to secure their subscriptions, and every one who takes a little trouble to present the paper to others, and invite such subscriptions, will be entitled to the premiums offered.

The Sliding Gate.—"M. J. S.," Butler Co., Pa. On reference to the *American Agriculturist*, for Dec., 1879, page 521, it will be seen that the so-called "Lee patent," on the common sliding gate, and another known as the "Teal patent," have been brought into court in Michigan and defeated, the court having decided that these patents were illegal. This is a sufficient answer to give to any person claiming a patent right fee for the use of any such gate. Thousands of dollars have been fraudulently collected under these illegal patent claims.

The President's Message in what it says of the financial position of the nation, its peaceful relations at home and abroad, our abundant harvest, and all other things relating to our material prosperity, will meet with a hearty response from every thoughtful person. But the President says other things, with which we cannot agree, and makes recommendations which ought not to be adopted. In spite of the deplorable figure our Government makes, so far as it has gone into the business of agriculture, he proposes to extend it, and to add divisions of Forestry, and of Veterinary Matters, to the present Department of Agriculture. Even Presidents do not appear well, when they talk on subjects about which they know little, and we regret that a message which begins so well, should have so lame an ending.

Disease in Fowls.—"J." When the head and eyes of fowls swell, and fetid matter comes from the nostrils, the disease is Roup. It may be cured by washing the head, mouth, and nostrils, with warm vinegar, and dressing the nostrils and throat with a soft feather dipped in a solution of one dram of Sulphate of Copper (Blue Vitriol) dissolved in a tea-cup full of water.

Books on Orcharding and Gardening.—We are often asked by those who would select some book as a guide in the different departments of horticulture, which one of several will best answer their purpose. Perhaps we can aid to a selection by enumerating the leading works in each branch of horticulture. For the Orchard, from starting trees in the nursery, planting and general management, no other work is so full and complete as the "Fruit Garden," by P. Barry. It is unfortunate that the title does not convey an idea of its full scope. It describes select lists of fruits of each kind. For a list and descriptions of nearly all known varieties, Downing's "Fruits and Fruit Trees of America" is best for reference. In Small Fruits, "The Small Fruit Culturist and Grape Culturist" by Fuller, and Roe's "Manual of Small Fruit Culture." For Market Gardening, "Gardening for Profit," by Peter Henderson; "Money in the Garden," by P. T. Quinn; "Farm Gardening and Seed Raising," by F. Brill, is a most useful work, and the only one of its kind. For the Flower Garden, "Breck's New Book of Flowers" is still the favorite with those who follow old-fashioned gardening. "Practical Floriculture," by Peter Henderson, is suited to both the professional florist and the amateur—and "Gardening for Pleasure" by the same author is intended for those who wish one book to tell them all that they wish to know on fruits, vegetables, and flowers. There are many other works, which will be found in the advertised book list.

Extermination of Willows.—"J. P. T.," Rio Grande Co., Col., asks: "How can Willows and their roots be most easily destroyed?"—Our native Willows, as a general thing, grow where they are most needed, along the banks of streams, where they render most valuable service in keeping the banks from being washed. Those which are above ground, mere bushes, have very long, far-reaching roots, and often of much greater diameter than any of the stems. In clearing land it is desirable to leave this natural barrier to the encroachments of the water. But to exterminate them from land which it is desired to clear, is our friend's question. He says that cutting them with the axe is most tedious work, and asks if any implement is made for the purpose. There are bill-hooks, an old-fashioned implement for clearing under-growth; the brush scythe, a short, thick, and heavy scythe, made for the work indicated by its name; then there are implements made especially for tropical countries, the "machete" and cane-knives, very heavy, long-bladed knives that are most effective in the hands of those accustomed to them. Among these no doubt something can be found that will make more rapid work than the axe, which will still be required for the larger Willows. A grub-hoe should be used for the roots, and when all of these that is practicable are removed, there will be a continous sprouting from what remains in the soil; these may be kept down by goats, or perhaps by sheep.

Atavism, what is it?—"A Reader." When an animal possesses any peculiarities not found in its parents, as of form, color, disposition, etc., but common to grandparents some generations back, it is said to have obtained them by *atavism*. It is the cause of croppings out of characteristics in distant descendants; or to put it in another way, a reversion to an older form.

Fastest Time—An Interesting Table.—

Year.	*Horse.*	*Time.*	*Year.*	*Horse.*	*Time.*
1810..	Boston Horse....	2.48	1867..	Dexter	2.17¼
1833..	Confidence	2.36	1871..	Goldsmith Maid.	2.17
1834..	Edwin Forest..	2.31½	1872..	" "	2.16¾
1845..	Lady Suffolk....	2.29½	1876..	" "	2.15
1849..	Pelham	2.28	1874..	" "	2.14
1853..	Highland Maid..	2.27	1878..	Rarus	2.13¾
1859..	Flora Temple....	2.19¾	1879..	St. Julian	2.12¾

Eating Shot.—The London *Lancet* cautions those who eat game, to be careful and not swallow the shot by which the animal was killed, as serious results have followed taking Lead into the system in this manner.

A Horse in Poor Condition.—"C. T.," Kent, Iowa. A horse that is in poor condition, and troubled with worms, will probably be relieved by a dose of one pint of Linseed Oil, given even every third day, for three times, then give weekly a pint of the Oil, with one ounce of Spirits of Turpentine. Feed bran mashes, boiled oats and potatoes, giving them slightly warm.

Jack Rabbits.—"O. B. O." writes that four years ago parties in Kern Co., Cal., imported greyhounds from England, for the protection of their crops, there being "millions" of the pests in that and adjoining counties. The statement would have been more complete, had he told us what success attended the experiment.

To Utilize Straw Without Stock.—"L.P.F." Charles City, Iowa. When stock are not kept by which straw can be made into manure, it is well in many cases to spread the straw over the fields and let it rot, or plow it in—preferably the latter, for if left loose upon the surface it would probably blow into heaps.

Cotton Seed and Linseed Cake.—Dr. Lawes estimates the *manurial* value of these two concentrated foods, at $29 per ton for the former, and $23 for the latter. This is more than the market price of cotton-seed meal with us at the present time. Does this not appeal to the American stock feeder, to use these concentrated foods more abundantly!

Bran as a Food has not been fully appreciated. The laxative tendency does not produce any unsatisfactory results, provided the bran is fed as it should be. A slight laxative condition of the bowels is better than the constipation that a lack of such food produces. Besides, the bran is rich in phosphates, so essential to the development of healthy stock.

The American Agricultural Association.

Last month we announced that the preliminary steps had been taken towards the formation of an Agricultural Society which should be truly national in its scope and membership. The meeting for final organization was held in New York December 10th-12th and was quite as largely attended as the most sanguine friends of the enterprise could have expected, while the assemblage was of a character such as one rarely sees brought together. Indeed, the gathering was a remarkable one for the solidity and dignity of its members, it being composed, with few exceptions, of men of middle age. The first day was devoted to preparatory work, and in the evening the meeting was addressed by Prof. A. R. LeDoux upon the "Adulteration of Seeds," and by Dr. M. Miles on "The Correlation of Forms in Animals," abundantly illustrated by the aid of one of McAllister's fine stereopticons. On the second day the election of officers took place, which resulted as follows: *President*, John Merriman, of Maryland.—*Vice Presidents at large*, N. S. Townsend, Ohio; Moses Humphrey, New Hampshire; J. C. Stevens, Ohio; J. B. Bardwell, Maine; G. Gregory Smith, Vermont; David Taggart, Pennsylvania; E. H. Hyde, Connecticut; John Scott, Iowa; George H. Cook, New Jersey; Ashbel Smith, Texas; C. V. Riley, District of Columbia.—*Vice Presidents*, L. L. Polk, North Carolina; Dr. Henry M. Ridgley, Delaware; C. W. Thompson, Minnesota; S. D. Gillett, Illinois; Daniel Needham, Massachusetts; Edward D. Pearce, Rhode Island; J. W. Avery, Georgia; Ezra Whitman, Maryland; John D. Adams, Arkansas; D. Wyatt Aiken, South Carolina; Governor George F. Drew, Florida; F. T. Francis, Alabama; Governor Alcorn, Mississippi; Colonel J. B. Killebrew, Tennessee; Cassius M. Clay, Kentucky; J. Floyd King, Louisiana; Roger W. Woodbury, Colorado; John Bidwell, California; S. G. Reed, Oregon; John P. Jones, Nevada; Henry G. Davis, West Virginia; General Gilbert S. Meem, Virginia; Claude Mathews, Indiana; Chester Hazen, Wisconsin; H. G. Wells, Michigan; J. H. Scofield, Kansas; D. H. Wheeler, Nebraska; Prof. G. C. Swallow, Mo., and Lawson Valentine, New York.—*Directors for one year*, N. F. Sprague, Vermont; P. M. Pulford, Maryland; Thomas M. Holt, North Carolina; T. E. Gould, Illinois, and J. N. Coleman, Missouri.—*Directors for two years*, Major Alvord, Massachusetts; A. L. Kennedy, Pennsylvania; J. T. Henderson, Georgia; —— McGrath, Kentucky; —— Trumpy, Michigan; J. B. Grinnell, Iowa; Powell Clayton, Arkansas.—*Directors for three years*, Governor Fred Smyth, New Hampshire; General N. W. Curtis, New York; Robert Beverly, Virginia; M. J. Lawson, Ohio; William S. King, Minnesota; Henry Hubbard, Colorado; General A. T. A. Torbert, Delaware. Mr. J. H. Reall was chosen *General Secretary*, and Lawson Valentine, of N. Y., *Treasurer*. The Board of Directors appointed an Executive Committee, to consist of: The Senior Vice-President, N. S. Townsend of O., and others.

The principal addresses on the second day, were by Professor C.V. Riley, of Washington, on Agricultural Advancement in the United States, and by Prof. W. O. Atwater, of Wesleyan University, Middletown, Ct. Both gentlemen took occasion to compare our government's efforts on behalf of agriculture, as manifested in the seed-shop at Washington, with the unostentatious, inexpensive, but wonderfully efficient methods of European governments. On the third and last day the Society was addressed by Prof. X. A. Willard on The Dairy; Prof. W. H. Brewer, of Yale, on Science and Agriculture; Peter Collyer, Chemist to the Department of Agriculture, Washington, on Sugar from Sorghum and Corn Stalks. The concluding address was by the Hon. J. B. Grinnell, of Iowa, who gave a very enthusiastic and patriotic address on agriculture in general. We look upon the beginning of this Society as a success, and as full of promise. An excellent spirit pervaded the meetings, which we trust may be found in all future sessions of the Society.

The American Dairymen's Association will hold its 15th Annual Convention at Syracuse, N. Y., January 13-15. An attractive programme is sent us, containing the subjects of addresses by Prof. James Law, E. W. Stewart, G. C. Caldwell, L. B. Arnold, and others. All Dairymen are earnestly invited to be present and participate in the work of the Convention.

Manure a Product of Feeding.—We wish to call the attention of all readers to the above point, as set forth in Professor Atwater's article. Read it carefully.

Hatching Codfish.—Professor Baird's attempts in hatching codfish have been successful, and the Commissioner hopes to re-stock the waters of New England—waters where formerly this valuable fish was abundant.

Pine Cones for Kindlings.—When dry, the cones from pine trees are excellent for starting fires; they so abound in resin that a small amount answers.

Agricultural Stations and Departments.

In an address before the "American Agricultural Association," on Dec. 12th last, Prof. W. O. Atwater gave an account of the European Agricultural Experiment Stations, and then contrasted our so-called Department of Agriculture with these useful institutions. Among other things he said:—"In 1876, the annual expenses of the *Sixty Six* German Experiment Stations was $156,750. Fifty-two per cent of this came from Governments, 17% from societies and public-spirited individuals, and 31% from fees for analyses. According to the report of our Commissioner of Agriculture for 1878, the running expenses of our Agricultural Department from 1839 to 1878, forty years (exclusive of double this sum for cost of printing and buildings), were over $85,000 per year; total, **$3,404,754.13.** The current expenses of the last three years are: 1877, $174,686.96; 1878, $188,640.00; 1879, $304,900.00. The current expenses for 1878 included for salaries, $65,640.00; for collecting statistics, $15,000.00; for laboratory, $1,000.00; for purchase and distribution of seeds, $75,000,00. Roughly speaking, we may say that the system of accurate experimenting in agricultural science, whose results we have been considering, dates from about the same time as our Agricultural Department, although the Experiment Stations commenced a dozen years later. No exact figures of the whole expenses of the European Experiment Stations are attainable. It is safe to say, however, that they have cost the Governments very much less than our Department of Agriculture has cost us—*i. e.*, less than the current expenses of the Department. The printing of the Reports costs as much or more than the current expenses. That is to say, either item, Current Expenses or printing of Reports, has cost the U. S. Government more than the European Experiment Stations have cost their Governments. The best information—nearly all the definite, accurate information we have of Agricultural Science has come from this European work. How much has come from the U. S. Department, everybody knows. "*Look on this picture and then on that.*"

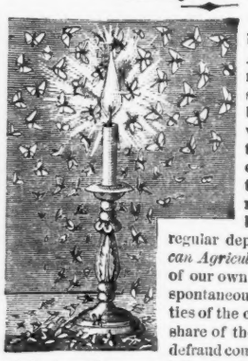
The Prussian Government pays for its thirty Experiment Stations which include the most productive ones in all Europe, almost exactly the same sum per annum that the U. S. Agricultural Department has almost uselessly expended for *the purchase and distribution of seeds.*

The Second International Dairy Fair.

In January last, we gave an illustrated account of the Dairy Fair held in Dec., 1878. Though this was an impromtu affair, its success was such that an Association was formed, which is now, Dec., 1879, holding a second exhibition. As we go to press, the Fair is in its fourth day, and yet all the details are not complete, much of the machinery is not in working order, and as the Judges have not made their awards, the names of competitors are not placed upon their exhibits. The boy who boasted that he knew how butter was made, said: "You take a long kind of pail, and swash a stick up and down in it. Then you want a cow." We will, as a "condition pecedent," put the cow first, and say that the exhibition of dairy stock is very much larger than at the former exhibition. The greater share of the animals are placed in the "Machinery Annex," and we think it a mistake not to have had all in the same place, as one can better compare the animals when close together, and the confined air of the main room, where the butter and cheese are to be judged, would have been free from that animal odor which cows, however choice and however well cared for, will give off. To begin with the cow. The largest number is exhibited by William Crozier, of Northport, L. I., who has in all 37 head, in which the Jerseys predominate; but there are also Ayrshires, and Gurnseys, including besides cows, bulls and heifers, and all the way down to the four-weeks calf. Some of the animals have a remarkable record. One of the bulls seems to us a perfect specimen of the Jersey breed. James Nielson, New Brunswick, N. J., exhibits about a dozen Dutch cattle, which he has labeled "Holsteins," although no such breed is known in Holland; his pens include a very fine bull, with the appropriate name "Taurus." Dr. A. D. Newell, of the same place, has some fine Jerseys, and so has John J. Holley, of Plainfield, N. J. S. M. D. Wells, Wethersfield, Conn., sends representatives of his noted herd of Ayrshires; Harry A. Weed, Stanford, Conn., and his neighbor W. H. Walmsley, both show fine Devons for which they claim excellent milking qualities, and that they will turn off as excellent beef animals; F. W. Decker, of Dutchess Co., N. Y., has Shorthorns, two of the cows being white.

In Cheese, Messrs. H. K. & F. B. Thurber & Co., whose pyramid we noticed last year, confront the visitor as he enters, with an obelisk of this edible, 40 feet in hight, built up of cheeses of various kinds, and embellished by quaint mottoes. The next most conspicuous object is the pyramid of bags of salt erected by F. D. Moulton & Co., of which it is not necessary to say more than it is "Ashton's Factory Filled." W. W. Ingraham, of Jefferson Co., Wis., has a handsomely arranged pyramid of red and white cheeses. A very attractive exhibit is one of imitations of the various European styles of cheeses by Roethlisberger & Gerber, New York; here are cheeses in all possible sizes, shapes, and colors. We notice that the Limburger is placed under glass, a rather frail inclosure for so *strong* a subject. Butter thus far is labeled by States, but the names of the makers will be given when the awards have been announced. Dairy appliances, in the way of churns, to the very last step in packing and marketing, are numerous almost to bewilderment. It is interesting to note the great variety of devices for accomplishing the same end: the simple act of setting cream is made the subject of several inventions, while churns are proverbially endless in styles. It would occupy pages to give even brief mention of these "appliances." The machine for separating cream by centrifugal force, was not yet ready for operation at the time of our visit; much is expected from this application of centrifugal force in the creamery, and it is thought by many that it will effect a *revolution* in butter-making in a double sense. Whitman, Burrell & Co., Little Falls, N. Y., have a cheese factory in full operation; it forms a most attractive feature of the fair to city visitors, who naturally have a curiosity to see how so generally an article of food is prepared.

Sundry Humbugs.



As the present number of the *American Agriculturist* will be read by many thousands we have never before addressed, we would say a word to them. The exposure of frauds, especially those upon farmers and rural residents, has been for many years a regular department of the *American Agriculturist*. It was nothing of our own seeking, but grew up spontaneously from the necessities of the case. By far the larger share of the schemes intended to defraud country people, have their origin in cities, especially the City of New York, and it was very natural, when these were presented to the rural readers of this paper, that they should appeal of us, as we were in most cases the only persons in the city of whom they could inquire as to the proposed schemes. From small beginnings our correspondence relating to Humbugs has grown up to be something formidable; the amount of labor it entails is only compensated for by the abundant assurance, which comes to us from all quarters, of the great utility of our exposures.

WHAT IS A HUMBUG?

We use the word "Humbug" as a convenient term for every scheme to obtain money or its equivalent without making a fair and proper return, as well as for every other form of imposition and cheating. A very comprehensive term it is, as the devices it includes are well nigh innumerable, and as the ingenuity of rascality is by no means exhausted, new forms of humbugs are constantly demanding our attention. While those who have long been readers of the *American Agriculturist* understand the matter, it may be well for us to say to new friends that this column is conducted solely with a view to

THE GOOD OF THE COMMUNITY.

It can not be made a medium for the settling of private grievances, and it will be of no use to send us a request to "show up so-and-so as a humbug" unless accompanied by full evidence that the party accused is worthy of a place in such select company.... There is perhaps no other subject upon which we receive so many letters as

SPECULATIONS IN STOCKS.

We had said all that was needed upon this matter, but many new readers have recently joined our circle, and frequent letters come from those who have not seen what has been stated. The country must be flooded with the circulars of parties who are, or who call themselves, "stock brokers." These present the case in a most persuasive manner; they show how a small sum may become large, and a large one larger, by handing it over to the senders of the documents. Our letters of inquiry almost invariably ask as to the character of the parties sending the circulars, asking if they will "do as they agree to do." It is impossible to give a "confidential answer" to any letter of inquiry, and we must here

REPLY TO MANY LETTERS

by saying that we have no little personal knowledge of any of the senders of the circulars, we have no reason to doubt that most will "do as they agree to do." —Let any one not infatuated by the idea of making money rapidly, read these circulars, and see how little they "agree to do," except to take the money sent and speculate with it. The character and business responsibility of the parties are not in question with us in our objections to

THESE STOCK SPECULATIONS.

We advise our readers to avoid them, not because of the parties who carry on the business, but because of the character of the business itself. The fact that many barkeepers are totally abstinent men does not prevent opposition to liquor-selling. The opinion of the best business men, bankers, and merchants of all kinds, is, that the kind of stock speculation proposed in the circulars referred to is pernicious in its influence, that its effects upon those who practice it are similar to those of gambling, and that in the interest of

SOUND BUSINESS PRINCIPLES

it should be discountenanced and suppressed. Regarding success in such speculations as only more unfortunate than losses, on account of the infatuation it encourages, we have uniformly discouraged our readers from engaging in any of the schemes, no matter how attractively they may be presented, or how great the prospect (or hope) they present of sudden gain.

LOTTERY SCHEMES IN CONGRESS.

The consternation among lottery men, caused by the enforcement of existing laws has been already mentioned. The Post-master General has in the second week of its session caused to be presented to this Congress an amendment to the law as it now stands, which covers the defects of that law, and facilitates the exclusion of lottery matters from the mails. The lottery people are to make an appeal to Congress, and present their grievances; watch the votes when the bills come up, recollecting that the lottery chaps have money in plenty, and it is a question to them of life and death. Watch the votes! But if lotteries are to be excluded, why not the stock speculators, which offer the lottery, only in another form? Do not make fish of one and flesh of another.... J. G. B., St. Louis, Mo., sends us a remarkable circular of a

"PASTOR-I-AL COLLEGE."

Now this is not, as some may suppose, anything like a theological school where pastors are educated—no—this "Pastor-i-al College" guarantees "in a course of thirteen weeks, to teach any man of ordinary ability the business of raising cattle and horses, sheep," etc., etc. Now here's a college as is a college. It underscores the important assertion—"*We do not teach from books*"—probably not, and with good reason. It looks very much as if the aim and object of this circular was to sell a work for 75 cents. ....Last month we gave the manner in which

ROGUES WELCOME STRANGERS.

There are gangs of rascals who hang about the streets leading to the principal depots, ferries, etc., to overhaul strangers, and they actually watch for their prey upon Broadway in broad day light. Their method is to pretend to know the stranger, be glad to see him, get at once into his confidence, and on one pretence or another, such as showing samples, etc., get him into some place where they can fleece him. Incredible as it may seem, this game is frequently successful. Soon after giving an account of this matter last month, a case was reported in the daily papers, in which a clergyman from Illinois fell into the hands of these chaps. One who pretended to know him induced him to go into a place to see some samples of tea. Here were several friends of the tea-man. One of these complained that he had lost a sum of money at cards, the others laughed at him, the minister "reasoned" with him, remarking that "he did not see how he could be so foolish."—"But did you ever see the game played?" said Scamp.—"Never," said Parson.—"Well, I should just like to show you how it was done. Have you any money?" —"Yes, 40 or 50 dollars," said Parson. — Such was his anxiety to understand the matter that he

ACTUALLY PUT DOWN HIS MONEY

for two of the rogues to show how the game was played. They played, and in a short time one of the rogues won all the parson's money and put it in his pocket. Of course, that was the last of that money. There was a row, arrests were made. Parson could not give bail for his appearance at the trial, and was locked up in the House of Detention—which is the next thing to a jail—with a prospect of remaining there until the trial, some two months off. Moral:

AVOID ALL ADVANCES OF STRANGERS,

if you are a stranger yourself in a strange city, especially in New York.... The "Chicago Tribune" has been showing up the operations of a chap with a

"MAGIC BONE DISSOLVENT"

not a dissolvent for converting dead bones into superphosphate, but for curing spavin, curb, ring-bone, "within thirty-six hours, without breaking the skin." Quackery in horse medicine, is not so rare a thing, but we were attracted by the name "Horton." Could it be *our* Hor-

ton, he of the wonderful "Stump Extracting Powder." To be sure, the Chicago Horton was a "C. G.," while our Horton was a "W. V.," but the difficulty of finding *any* Horton, the presence of some one else to answer questions in both cases, lead to the fearful suspicion, that one who was on so familiar terms with lightning, as to cause it to come up a wire with "a pinch of salt on its tail," and annihilate a veteran stump, would be able to convert a "W. V." into a "C. G." ...In Chicago, where the great interest is grain, and they make "corners in corn," they play their little games of

PUTS AND CALLS IN WHEAT

after the manner that is done on stocks in New York, and the business there, as in New York, is done by parties who find their customers at a distance from the city, and among the rural population, or "grangers," which is the slang name of the city papers for farmers.

THE BIBLE AND DICTIONARY OFFERS,

notwithstanding that it was long ago exposed, is still carried on by parties near New York, though the originators of this scheme, in small places, have been stopped long ago. The plan is to advertise a dictionary worth $5 or $6, for 35, or 54 cents. In the cases that have come to our knowledge, the book sent has not been worth in the trade, as much as 25c. wholesale. If, in cases like this, people would recollect, that really valuable things are never sold for less than they are really worth, such games could not last. When the parties who advertise these $6.00 Dictionaries for 35 cents, actually send the book they really advertise, one gets near his money's worth; the fraud is in representing the book as a Six-Dollar one.—A "wounded bird" in Brooklyn, who applied to himself our hit at this misrepresentation in May last, tries very hard to strike back by sending on his postal card a statement that his "little book" is worth so much more than the publications of O. J. & Co. Keep on doing so, Mr. Blank, if it does you any good. We never object to such free advertising ...When an article is offered for *much less* than its real value, it is safe to conclude, that its value

IS NOT AS REPRESENTED,

or that there is some object in making the offer which is not apparent. It is safe to let alone all articles, that, like these dictionaries, are offered at less than a tenth their *alleged* worth.....A chap in Philadelphia, offers a "New Domestic Bible." He describes a large Bible, the contents, number of engravings, size of pages, and all that, and claims it to be "as good as those sold for $15 in any book store," and says: "To introduce our Bibles, we agree, upon the receipt of $1, to pay the postage and other expenses, to send *a* copy of the Holy Bible" etc. This is too thin.....We have already had batteries of many sorts, but never before have we had the

"MINIATURE BATTERY."

A long circular in very fine print, tells all about it. The pictures are only three, but telling. One is a man, or the upper part of him, heavy as to beard, and nothing as to clothes, with one of these batteries right over his breast-bone, and he don't seem to mind it a bit. The second is a picture of the earth; that respectable old planet is being badly struck by just the crookedest kind of lightning. The third is a picture of the Battery, "of the exact size," which is that of half a dollar. The "Professor" who has this miniature Battery, is down upon all Electric Chains, Belts, and Bands—and we should think he would be—for they give down only common, plain electricity, old fashioned lightning as it were, but this Battery is up to the times with a new sort, the

REAL GIMLET-POINTED LIGHTNING!

This, absurd as it may seem, is an actual claim; we are told that the Professor said: "That the various blocks of metal were so placed, that when the electricity was formed, it would be *formed in gimlet shape*, and he said it would enter the system in that form, and *pass on twisting*, until it spent its force." Yes, the lightning is not only "gimlet pinted," but it goes on a "twistin." On the whole, we prefer the old style. Yet people will read nonsense like this, and believe it. Boyd, you are the worst electrical humbug yet.....In medical matters, the

RECIPE NUISANCE

seems to be the most prominent. We would say to our newer readers; if tempted by the advertisement of any young fellow, whose "sands of life are fast running out," or any "retired missionary," or any chap who met a missionary in foreign lands," or of any one else, to send for his or her recipe;

DON'T!

This recipe business is one of the meanest forms of quackery. The chaps offer a Recipe. It will be entirely in unmeaning jargon, or all the articles but one or two will be well known things, but these, the most important will be names, unknown to medical, or any other science. The chaps inform the person to whom the recipe is sent, that said articles are very difficult to obtain, that druggists never have them fresh, (nor at all, as their "ain't no sich") and that they, at great trouble and expense, have imported a lot of the "Original Jacobs," which they will put up for the sufferer, at what will barely cover the cost —$3 or $5.—We would say a word to our new friends,

ABOUT ADVERTISING DOCTORS,

which may save them some trouble in writing to ask our opinion of this or that one. We regard every doctor who advertises that he can cure this or that, especially those who warrant a cure, as an enemy to the public welfare, and to be avoided. We do not know any of them, and advise every one to keep clear of all of them. Moreover, every medical compound, the composition of which is kept secret, we regard as dangerous to the public welfare, and instead of being taken by the people should be *taken* by the police and destroyed; as our laws are not up to our needs in this respect, we can only advise every reader of the *American Agriculturist*, to let everything of the kind entirely alone.

LATER—ABOUT STOCK GAMBLING.

We have alluded above to the general excitement on the subject of stock speculations, as indicated by the numerous letters to us. It seems to be an all-pervading mania, and it is said that even women participate in this form of gambling. A recent paper states that one lady's operations were far from encouraging. She gave her broker $1,000 with which to operate; her investment brought her nothing, but the broker brought in a bill for $5,000 for his commissions. This looks like a large story, but it appears in a commercial paper of good standing. A friend who knows about such matters informs us that the extent to which the country people are engaged in these speculations is astounding; they are known in

THE SLANG OF THE STREET AS "THE LAMBS,"

and the knowing ones talk of "shearing" their country customers. A farmer of our acquaintance has called in to request us to present our warning with still greater force. He says that a neighboring farmer, who, in spite of his warnings, has engaged in the "put and call" business, has just been sold out under a chattel mortgage made to those from whom he borrowed money to speculate with, in the vain hope of getting back that which had gone before. It is the same old, old story; when one once becomes infatuated with the desire to get rich suddenly, by some lucky chance, whether in the lottery, or by stock gambling, he is already on the high road to ruin. To those who have become engaged, ever so little, we say, stop short. To those who are hesitating on the edge, we say: Touch not! The motto appropriate to all the avenues to Wall street is:

"Let him who enters here leave Hope behind."

Shape of Meat-Producing Animals.—The best animals for producing meat are those with large and healthy organs of nutrition, and sufficient room near by for the storing away of the meat. These two and other reasons determine that the best meat-producing animals are built on the plan of a square when viewed from before or behind, and a parallelogram in side view —or what is called the "rectangular type."

Self-Sharpening Horse Shoes.—By the simple expedient of rolling a steel plate in the center of the iron from which the shoe is made, the calks of the shoe have a hard steel center, and as the soft iron wears away by use, the sharp steel is left to prevent slipping. The manufacturers, Messrs. Shoenberger & Co., of Pittsburgh, Pa., send us a part of a shoe that was worn all winter, which shows the effect of wear in exposing the steel center. Those who travel upon icy and frozen roads know the difficulty of keeping the horses properly "sharp," especially if they live at a distance from a blacksmith; with a set of these shoes, the animal is prepared for all weathers, and can travel and work more effectively than when in danger of slipping, and with greater safety to the driver. The firm make self-sharpening shoes of the ordinary form, and also the "Snow-shoe Pattern" in which the shape is such that the snow can not ball upon the animal's feet.

Ensilage: Silo Opening.—The first Silo in America, built on the French plan, of M. A. Goffart, was opened at "Winning Farm," J. W. Bailey, proprietor, Billerica, Mass., on Dec. 3, last. This Silo, or fodder pit, is 40 feet long, 12 feet wide, and 16 feet deep, roofed, and having a capacity of 500 tons. It was partly filled with green corn stalks, cut by an ensilage cutter, the pieces being 4½ inches in length. After this cut fodder had been thoroughly tramped down by men, a layer of straw, 12 inches thick, was spread over it all, and the whole covered closely with planks, upon which about 50 tons of stones were placed. This was done early in October. At the opening of the silo, the fodder was found to be in an excellent state of preservation; at first a little sour, but in a short time this sourness passed away, and when fed to cattle or sheep was eaten with a relish. A number of agriculturists and members of the press were present, in fact, the "opening" of the silo was well attended, and voted a success.—Mr. Bailey is so well pleased with his experiment that he will practice this method of preserving green fodder in a green state to a larger extent the coming season. Others have also expressed their intention to erect silos at an early date. This is one of the most important of recent improvements in agriculture, and one which every one who raises corn fodder should investigate before the next crop is harvested.

A Safe and Handy Knot.—It frequently happens that a rope, strap, or even string, breaks, and it is necessary that the parts separated should be securely fastened together. One of the best methods of tying a

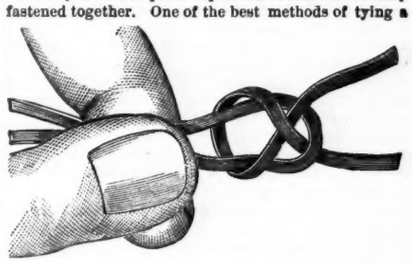


Fig. 1.—TYING THE KNOT.

firm knot consists of forming a loop of one broken end, after which the other portion of the rope is passed through it, as shown in figure 1. If the rope or strap is long, the same knot may be tied by passing the broken

Fig. 2.—PARTLY DRAWN UP.

end under, and then around the loop, and under itself, thus saving the trouble of drawing the whole length of the rope through the loop, a back-handed way of arriving

Fig. 3.—THE COMPLETE KNOT.

at the same result. This knot when tied, and still loose, is as shown in figure 2; when drawn up tight, it is as in figure 3. This knot is especially adapted for tying pieces of harness, halters, etc.

Twin Lady Apples.—Our notice of twin apples last month, reminded Mr. W. W. Young, Jefferson Co., Ky., that his Lady Apple trees frequently bore twin fruit, and sends us three specimens of this doubling. He thinks the variety given to producing such freaks, as he frequently finds them in picking the fruit. We quite agree with him when he says, "We consider it about Christmas a very fine apple."

Hardened Glass, from which great things were expected, has been but little mentioned of late. Recently, in view of the great losses by hail in England, it is proposed to use the Bastie, or hardened glass, in greenhouses and for other horticultural buildings.

Hard-Pan—What is It?—"M. E. C," Soils are divided into three classes: *Surface Soil*, *Subsoil*, and *Hard-pan*. The surface soil is the upper portion and that which is turned by the plow; in fact, the soil that interests the farmer most. The subsoil is below the surface soil, more compact and often of a different color. Sometimes the line between the surface and subsoil is quite distinct, but generally not. Hard-pan is a still harder layer than the subsoil, and lying below it. This hard stratum may be but a short distance below the surface, while in other places it is not to be found. It is a very hard soil, or one that is approaching the nature and texture of a rock.

Michigan State Farmers' Institutes.—The State Board of Agriculture has decided upon the times and places for holding a series of Farmers' Institutes for 1880. There will be six such gatherings for lectures and discussions, held at widely separated points in the State, during the month of January. The Professors of the Agricultural College will take a prominent part in the meetings, two or more of them are to be present and give addresses at each Institute.

Largest Yield of Wheat.—The Territorial Fair Association of Montana has awarded the first premium for the best acre of wheat, the yield being **102 bushels.** This is believed to be the largest known yield of wheat.

Hired Help in Winter.—The average farmer—that is, one with 150 acres devoted to mixed husbandry—if he has no large boys, can generally find employment for one hired hand through the winter. There are many things that he can do as well as in summer, if not better, as the getting out of timber, rails, the year's fire-wood, and doing much shop-work, if he is handy with tools. In this way a man can be kept the year round and constantly on hand with very little more expense and much more comfort than to hire a new hand each spring.

American and English Agriculture as seen by English eyes. The average yield of wheat in Great Britain is 28 bushels per acre. Estimating rent, interest on capital, outlay for manure and labor, and the crop costs £8 per acre. "The Western farmer who has £2 sterling invested in his soil and its equipments, his expenses per acre would be somewhat as follows:" Interest on capital, 4s.; plowing, 10s.; seed, 6s.; reaping and binding, 10s.; threshing and marketing, 2s.; total, £1, 12s. The fourteen bushels (which is the average) of wheat will give a return of 42s., or a profit of 10s. per acre. "Two years' profit thus moderately estimated would purchase the fee-simple of much of the land in the Western States." The American farmer under the circumstances has much the larger margin of profit. "The American of a certain type has an instinctive aversion to the pursuit of an unprofitable calling; he has a wonderful capacity for accommodating himself to circumstances. If wheat-growing does not pay he tries dairying or gardening, and failing that, will cut down lumber or split rails, keep a store or 'run a hotel,' or even make politics his profession." The English writer claims no such smartness and versatility for his farmers, and does not expect it, as they are "not to the manner born."

Pleuro-Pneumonia.—From the English agricultural papers we learn that this dreaded and destructive contagious disease is breaking out in various parts of Great Britain. One grazier in Surrey has lost 44 head, and the authorities have ordered the immediate slaughter of the rest of the herd. One farmer in North Staffordshire was fined £10 for removing the remainder of his cattle to an adjoining farm. "Strong measures are being adopted to stop the infection."

Variety of Food.—It is a well established fact, that a single kind of food is not enough for the best growth, health, and comfort of animals. Like ourselves, the stock which we keep, *does* relish a change of diet—thrives better with a change of pasture so to speak—and gives fuller returns for the trouble of providing the variety of foods. Coarse fodder should be mixed with that which is of a finer nature; and the highly nitrogenous, fed with substances weak in nitrogen. Some farmers will feed their sheep corn one morning, and barley or oats the next, and thus keep up a continual surprise, hightened by a lick of salt now and then. It is the same love of change, which makes the colt, cow, and even the oldest horse feel glad when turned into a new field.

Treatment of Frozen Plants.—In times of the severe cold, the more tender plants in the window will sometimes be chilled and frozen. Such plants should not be put near the stove, to be thawed out; but kept where the temperature is a trifle above the freezing point that the thawing may be gradual, and in the dark, that deleterious chemical changes may not take place. If severely touched with the frost, it is best to remove the frozen parts, that new stems may be forced out from the buds below. Water freely, and finally bring them to the ordinary temperature for house-plants; 65 to 70 degrees.

Read the Market Columns.—The reports of Commercial Matters are made by experienced men, and with great care. These columns furnish much valuable information in the amount of various agricultural products, that have been bought and sold in the New York Market, and the comparisons with those of last year, are instructive. For example, under "Current Wholesale Prices," observe the advance in Potatoes, Timothy seed, Quinces, and especially in Apples. It will pay for all who have produce to sell, or to buy, to read the markets.

Wood Ashes.—The value of ashes as a fertilizer, depends principally upon the Potash and Phosphoric Acid they contain. The percentage of these varies largely, in ashes from different woods, varying from 10 per cent to 24 per cent for the former, and 4 per cent to 12 per cent for the latter. This would give not far from four to five pounds of potash to a bushel of ordinary mixed unleached ashes, which, reckoned at 4½ cents per pound—the present market value of potash in the commercial fertilizers—would give the value of a bushel as from 18, to 22½ cents. With due allowance for the Phosphoric Acid and the Lime—the latter making up the largest part of the ashes—it may be seen that a bushel of unleached ashes, is worth from 25 to 30 cents at the present time. Ashes, to secure the best results, should be thoroughly mingled with the soil. In this way, the best physical, as well as chemical effects are obtained. It is self evident that crops requiring larger amounts of Potash, will be the most benefited by the application of ashes, as the root crops, cabbage, tobacco, etc. Forty to fifty bushels per acre, is a good application.

An Extensive Country.—Not many days ago a prominent English agriculturist called at our office on his way home from a two months' *run* through some of our Western and North-western States. The feeling that was uppermost in his mind was the bigness of our country, and the large scale upon which everything is done by the American farmers. To use a familiar expression, he thought there were "millions in it," in rich acres, in bushels of grain, in heads of cattle, and in dollars for those who are at the work. Uncle Sam has in that snug little farm of his over *four hundred* million acres of land.

Root Pulp and Cut Straw.—As a matter of experience, it is found that the mixture of cut straw and root pulp, alternate layers of each, should stand for at least 24 hours before being fed, after which it becomes heated of itself, and the cattle eat it with great relish. There is nothing better for young and growing stock.

The Illinois Fat Stock Show.—The second annual exhibition of Fat Stock, held in the Exposition Building, in Chicago, was all that a large collection of the finest animals—horses, cattle, sheep, and swine, could make it. "Taken as a whole, in point of entries, in excellence and variety of the various classes, in the perfection of fattening, and in the attendance from day to day, this second annual exhibition may be called a most pronounced success, and will, it is hoped, be continued from year to year, until it really becomes what, in the outset, was intended to make it—the great National Show of the Fat Stock of America." During the show, a large specimen of each breed: Hereford, Shorthorn, and Devon was slaughtered, with the following interesting results:

Part of Animal.	*Hereford.*	*Short'rn.*	*Devon.*
Gross weight.....	1,963	1,794	1,614
Head, "	55	47	49
Hide, "	106	90	95
Gut, "	113	97	95
Rough, "	178	155	145
Fore Quarters, weight...	725	611	552
Hind " " ...	592	568	503

It will be seen that the Shorthorn has the greatest proportion of more valuable parts. A series of such comparisons would be of great value to fatteners of stock.

Parent and Offspring.—"Which parent has most influence upon the offspring?" This is a question which is coming up every day, and one that is almost impossible to answer. It is now well established that a thorough-bred animal, that is, one bred in the same line or strain of blood, and has thereby had its characteristics fixed, has the greater control over the characteristics of the offspring, be the parent male or female. A Shorthorn bred to a Native will have the Shorthorn points predominant in the offspring. Other things being equal, the vigor of the parent, high constitutional development, or what we are pleased to call *vitality*, is claimed by breeders to have more or less weight in shaping the constitution of the offspring. It is claimed by some that certain functions and organs are determined by the male, while others are under the control of the female. Thus the external character—outward structure—is said to be due to the male, and the inward to the female—as, for example, a cross between a dog (male), and wolf (female), gives more external marks of the dog than when the sexes are reversed, but there is so little definitely known in this regard, that at the present time it can only be said that it is not satisfactorily established how far, and in what directions, each parent controls the offspring.

Old and Young Stock for Fattening.—If one but takes the trouble to look over the reliable, recorded experiments of the feeding of pigs, steers, and other stock, it will appear evident that it takes less food to produce the same increase in young, than old stock. Such being the case, beef and pork growers should make it a point to fatten their stock so soon as it is fully grown. The greatly superior quality of the meat, as well as its cheaper production, both encourage the practice.

Horn Buttons are now mostly made of the hoofs of cattle, and not of the horns as formerly. Cattle hoofs sell at the present time, for about $50 per ton. The products of neat stock are very numerous, and there is scarcely a particle of the whole creature that goes to waste.

Pampas Grass Plumes have become a regular article of trade with the florists and seedsmen, and are among the popular articles for the winter decoration of rooms. The Pampas grass, *Gynerium argenteum*, is a native of South America, and requires winter protection in the Northern States; it succeeds admirably in the Southern States, and reaches its greatest perfection in California, from which State the greatest supply is derived. C. A. Reed sent a sample a short time ago, showing how finely this grass developes its silvery plumes at Santa Barbara. This grass is dioecious, i. e. has its sexes in different plants; it is the pistillate plant which has the more showy plumes. In the climate of New York it may be preserved by placing a box or cask over it and filling that with leaves, placing on a cover to shed rain; it is worth this slight trouble as a large clump of the foliage is a stately object, even should it fail to flower.

(*Basket Items continued on page* 33.)

Bee Notes for January.

At this quiet season, so far as regards the operations of the apiary, it is proper for those who have not introduced the Italians into their hives, as well as those who are about to commence bee-keeping, to consider the claims made for superiority of the Italians over the ordinary, or black bees. In the first place, the Italian bees are much more beautiful than the black, a point not to be overlooked in the choice of *anything*, even if all the other qualities are equal. They are more prolific; the queens depositing more eggs than the native. The expert bee-keeper can distinguish the Italian eggs by the compactness with which they are stored in the combs. The Italians are more hardy than the natives, venturing out in colder weather, and doing work while common bees remain at home. They, therefore, swarm earlier, an important factor in bee culture—the hives become populous early in the season, thus securing a large working force by the time the flowers are ready for them. As a natural result from what has just been said, the Italians gather more honey than the natives. Again, they work upon plants that the blacks do not visit, which, of course, gives them a wider range for honey gathering. Cases are known where Italians were gathering white honey exclusively, while the common bees were working only on the Buckwheat. The Italians are notably fond of the Red Clover, and will gather much more honey from this plant than the natives, which derive but little from it.

As they are more vigorous than the natives, they are better able to protect themselves, and to defend their stores, being more watchful and swift to discern the enemy. If harshly treated the Italian is worse to handle than the native. This naturally follows from its superior vigor and more active disposition, but when treated kindly, experience has shown them to be more docile, and more pleasant to manage than the others. The honey-comb made by the Italians is more compact, and presents a finer appearance than ordinary comb, the difference being so marked that experts claim that they can tell the kind of bee that produced a given box of honey. Lastly, the Italians are much longer lived than ordinary bees. This has been proved in many cases, and is a strong characteristic in favor of the foreign bee.

A Test Record for Dairy Cows.

For some time past both the breeders and the purchasers of pure-bred, herd-book-recorded, dairy cows, have been convinced that something more is required to give substantial evidence of value than the bare pedigree of an animal entered in a Herd-Book. A few experts, who know the whole history of the best animals, may have been able to judge of the possible merits of a particular animal by her pedigree, but to the large majority of purchasers, the recorded entries were of no more significance than the hieroglyphics which Texan cattle-men brand upon the flanks of their cows. Mystery is always impressive. And though some people like to be mystified, the larger number of dairymen, who have kept pure-bred animals, have been greatly dissatisfied with the uncertainties of the Herd-Books. Recently some facts in connection with the shipment to the West, and sale there of some cows recorded in the Jersey Cattle Club Register, have opened the eyes of the purchasers of pure-bred cattle, for they have been assured by the best authority that although a cow may have been recorded in the Register, and her pedigree may be perfect, yet she may possibly be "a worthless brute." This shock to the confidence of persons who had a profound respect for "a record," has greatly helped the impression that something more is wanted to give the pedigree a meaning and a value; and that this need is a *record* of *performances* of the cows entered in the Herd-Book. It is proposed by some well-known and influential gen-

tleman to establish a system of tests of pure-bred dairy cows, to the end that their character, quality, and value may be associated in the record with their pedigree. Then, any uninitiated purchaser even, may be able to know as much from a perusal of the record as any expert, and a cow's genealogy will be accompanied by an authenticated statement of the accomplishments of her progenitors. This seems to be all that is needed to make a record perfect, and we think it is a happy conception.

Science Applied to Farming, LIII.

Economy in Cattle Feeding, Composition of Foods, Feeding Standards and Rations for Farm Animals.

In last month's *American Agriculturist*, page 497, was given a Table of "*Composition, Digestibility, and Nutritive Values* of *Feeding Stuffs*, from a larger one by Wolff in the German "Farmers' Almanac for 1880." That table gave the average amounts of the food ingredients, albuminoids, carbohydrates, and fats contained in different foods, and likewise the amounts of these that are, from feeding trials, estimated to be actually digestible. It is the digestible parts of the food that supply the wants of the animal, that are made over into flesh and fat, skin and bone, milk and progeny, and are used to produce heat to keep the body warm, and muscular power for work. It is with these, therefore, that we have mainly to do in feeding.

Feeding Standards.

Having noted how much of the nutritive ingredients our feeding stuffs contain, the next step is to learn how much of each different animals need for maintenance and for production of meat, milk, work, etc. The German experimenters have studied into this matter very carefully, in two ways: first, by experiments, feeding animals with different kinds and amounts of food, and noting the effects; second, by observing the methods and results of feeding, as practised by the most successful farmers. On the basis of these two kinds of observations feeding standards have been calculated, as shown below. In brief, it has been found that full-grown oxen, at rest in the stall, can be kept for long periods in fair condition with food of such sort as to supply them, per 1,000 lbs. live weight, with 0.6 lbs. albuminoids, and 7.0 lbs. carbohydrates, in forms to be digested and taken into the circulation. It has been found well to have this supplied by 14–15 lbs. dry substance in the food. With rations furnishing these amounts of digestible ingredients, there has sometimes been observed a slight improvement, but perhaps oftener a small falling off in condition. It appears on the whole, better to increase the ration, so as to give 0.7 lbs. nitrogenous, and a little over 8 lbs. non-nitrogenous nutrients, with a nutritive ratio of 1:12. It seems to make little difference in what forms these are given, whether in hay, straw, oil-meal, or otherwise, provided the food be wholesome and palatable. These materials suffice to make up for the wastes of the animal's body, to keep it warm, and to produce the small amount of muscular power needed when the animal is at rest.

If, now, the ox is to be worked or fattened, food for production of meat or force is required. Or if, instead of an ox, we have a milch cow, she will need food for production of milk, in addition to what is necessary to maintain her body in good condition. And this food for production must be not only larger in quantity, but different in quality; it must have a larger proportion of albuminoids,—as the German's say, the nutritive ratio must be narrower. Thus Wolff recommends for a daily ration for milch cows, per 1,000 lbs. live weight, 2.5 lbs. digestible albuminoids, 12.5 digestible carbohydrates, and 0.4 lbs. digestible fats, with a nutritive ratio of 1:5.4. This is just about what would be contained in 30 lbs. of fine quality, young, cut hay, or 120 lbs. of young grass, either of which would make a very good daily ration for a milch cow. The following table by Wolff, from the "Farmers' Almanac" referred to, gives feeding standards for various domestic animals. The first column gives the total amount of organic substance—that is, the whole food, less water and ash, in the daily ration. The next three columns give the amounts of digestible albuminoids, carbohydrates, and fats. The fifth column, "Total nutritive substance," is the sums of the digestible nutriments in the previous three columns. The last column gives the ratio of albuminoids to carbohydrates, or the Nutritive ratio.

Feeding Standards.

KIND OF ANIMAL, WEIGHT, AGE, ETC.	Total organic substance.	Nutritive (digestible) substances.			Total nutritive substance.	Nutritive ratio.
		Albuminoids.	Carbohydrates.	Fats.		
A.—Per Day and per 1,000 lbs. Live Weight.	lbs.	lbs.	lbs.	lbs.	lbs.	as 1:
1. Oxen at rest in stall	17.5	0.7	8.0	0.15	8.85	12.
2. Wool sheep, coarser breeds	30.0	1.2	10.3	0.20	11.70	9.
" " finer breeds	22.5	1.5	11.4	0.25	13.15	8.
3. Oxen, moderately worked	24.0	1.6	11.3	0.30	13.20	7.5
" heavily worked	26.0	2.4	13.2	0.50	16.10	6.
4. Horses, moderately worked	22.5	1.8	11.2	0.60	13.60	7.
" heavily worked	25.5	2.8	13.4	0.80	17.00	5.5
5. Milch cows	24.0	2.5	12.5	0.40	15.40	5.4
6. Fattening oxen, 1st period	27.0	2.5	15.0	0.50	18.00	6.5
" " 2d "	26.0	3.0	14.8	0.70	18.50	5.5
" " 3d "	25.0	2.7	14.8	0.60	18.10	6.0
7. Fattening sheep, 1st period	26.0	3.0	15.2	0.50	18.70	5.5
" " 2d "	25.0	3.5	14.4	0.50	18.50	4.5
8. Fattening swine, 1st period	36.0	5.0	27.5		32.50	5.5
" " 2d "	31.0	4.0	20.0		28.00	6.0
" " 3d "	28.5	2.7	17.5		20.20	6.5
9. Growing cattle:						
Age, months. *Average live weight, ℔ head.*						
2— 3 150 lbs	22.0	4.0	13.8	2.0	19.8	4.7
3— 6 300 "	23.4	3.2	13.5	1.0	17.7	5.0
6—12 500 "	24.0	2.5	13.5	0.6	16.6	6.0
12—18 700 "	24.0	2.0	13.0	0.4	15.4	7.0
18—24 850 "	24.0	1.6	12.0	0.3	13.9	8.0
10. Growing sheep:						
5— 6 56 lbs	28.0	3.2	15.6	0.8	19.6	5.5
6— 8 67 "	25.0	2.7	13.3	0.6	16.6	5.5
8—11 75 "	23.0	2.1	11.4	0.5	14.0	6.0
11—15 82 "	22.5	1.7	10.9	0.4	13.0	7.0
15—20 85 "	22.0	1.4	10.4	0.3	12.1	8.0
Growing, fat pigs:						
2— 3 50 "	42.0	7.5	30.0		37.5	4.0
3— 5 100 "	34.0	5.0	25.0		30.0	5.0
5— 6 125 "	31.5	4.3	23.7		28.0	5.5
6— 8 170 "	27.0	3.4	20.4		23.8	6.0
8—12 250 "	21.0	2.5	16.2		18.7	6.5
B.—Per Day and per Head.						
Growing cattle:						
2— 3 150 lbs	3.3	0.6	2.1	0.30	3.00	4.7
3— 6 300 "	7.0	1.0	4.1	0.30	5.40	5.0
6—12 500 "	12.0	1.3	6.8	0.30	8.40	6.0
12—18 700 "	16.8	1.4	9.1	0.28	10.78	7.0
18—24 850 "	20.4	1.4	10.3	0.26	11.96	8.0
Growing sheep:						
5— 6 56 "	1.6	0.18	0.87	0.045	1.095	5.5
6— 8 67 "	1.7	0.17	0.85	0.040	1.060	5.5
8—11 75 "	1.7	0.16	0.85	0.037	1.047	6.0
11—15 82 "	1.8	0.14	0.89	0.032	1.062	7.0
15—20 85 "	1.9	0.12	0.88	0.025	1.047	8.0
Growing, fat swine:						
2— 3 50 lbs	2.1	0.38	1.50		1.88	4.0
3— 5 100 "	3.4	0.50	2.50		3.00	5.0
5— 6 125 "	3.9	0.54	2.96		3.50	5.5
6— 8 170 "	4.6	0.58	3.47		4.05	6.0
8—12 250 "	5.2	0.62	4.05		4.67	6.5

Practical Application. Calculation of Daily Rations for Farm Animals.

To use the feeding standards, let us take some of the feeding stuffs in the table last month, and leaving out of account the water, ash, and total amount of the ingredients, note the amounts of digestible ingredients, as shown in the condensed table below.

Digestible Ingredients of Fodder Stuffs.

KIND OF FODDER.	Digestible food ingredients.			Nutritive ratio.
	Albuminoids.	Carbohydrates, including fibre.	Fat.	
I. Hay.	%	%	%	as 1:
Meadow Hay, poor	3.4	34.9	0.5	10.6
" " medium	5.4	41.0	1.0	8.0
" " very good	7.4	41.7	1.3	6.1
Red Clover, poor	5.7	37.9	1.0	7.1
" " medium	7.0	38.1	1.2	5.9
" " very good	8.5	38.2	1.7	5.0
II. Straw.				
Winter Wheat	0.8	35.6	0.4	45.8
Winter Rye	0.8	36.5	0.4	46.9
Oat	1.4	40.1	0.7	29.9
III. Roots and Tubers.				
Potatoes	1.1	22.8	0.2	21.6
Sugar Beets	1.0	16.7	0.1	17.0
Turnips	1.1	6.1	0.1	5.8
IV. Manufacturing and Waste Products, etc.				
Sugar Beet Cake	1.8	24.6	0.2	13.9
Malt Sprouts	12.8	51.6	1.7	4.7
Wheat Bran, coarse	12.6	42.7	2.6	3.9
Rye Bran	12.2	46.2	3.6	4.5
Linseed Cake	24.8	27.5	8.9	2.0
Palm Nut Cake	16.1	54.4	9.5	4.9
Cotton-seed Cake	17.5	14.9	5.5	1.7
Cotton-seed Cake, decorti'd	31.0	18.3	12.3	1.6
Flesh Meal	69.2	....	11.2	0.4

Suppose now that I wish to feed my oxen that are standing in the stable doing no work, on medium quality hay and oat straw, and add enough wheat bran to keep them in good store condition. By the above figures there will be contained in:

	Albuminoids.	*Carbohydrates.*	*Fats.*	*Total.*
6 lbs. medium hay	0.32 lbs.	2.5 lbs.	0.06 lbs.	2.88 lbs.
12 lbs. oat straw	0.17 lbs.	4.8 lbs.	0.08 lbs.	5.06 lbs.
2 lbs. wheat bran	0.25 lbs.	0.8 lbs.	0.05 lbs.	1.10 lbs.
Whole daily ration	0.74 lbs.	8.1 lbs.	0.19 lbs.	9.03 lbs.
Standard ration	0.8 lbs.	8.0 lbs.	0.15 lbs.	8.85 lbs.

That is, 6 lbs. of medium hay, 12 lbs. oat straw, and 2 lbs. wheat bran, will furnish just about the quantities of digestible albuminoids, carbohydrates, and fats, that the standard per day for 1,000 lbs., live weight, requires.

My friend and former assistant, Prof. W. H. Jordan, of the Maine Agricultural College, has made use of the feeding standards above given, in calculating the following rations for various farm animals. It is not meant that just these proportions must be used. There are wide variations in the composition, digestibility, and flavor of the same feeding stuffs. So likewise the individual peculiarities of the animals, their size, condition, varying capacities for digesting, and more especially, for their food, differ greatly. Hence the rations need to be adapted to particular cases. The important thing is to mix the foods on hand, or to be bought, so as to secure the best results at the lowest cost. These are simply examples of mixtures that contain the nutrients in about the proportions believed to be best adapted to the purpose. I cannot give what seems to me the right view of this system of calculating food-rations, better than in the words of a shrewd and intelligent German farmer, who has had considerable experience in their use: "As indications of what is best, they are invaluable; to follow them blindly would be folly."

Daily Rations for 1,000 lbs. Live Weight.

A. Maintenance, Fodder for Full Grown, Labor-free Oxen.

No. 1.	*No. 2.*	*No. 3.*
6 Med. meadow hay	5 Clover hay, best	6 Poor Timothy
12 Oat straw	18½ Wheat straw	17 Corn stalks
2 Wheat bran	½ Linseed cake	4 Corn meal
No. 4.	*No. 5.*	*No. 6.*
15 Oat straw	10 Poor Timothy	6 Clover hay, best
20 Potatoes	20 Sugar beets	15 Oat straw
1 Cotton-seed meal	2 Corn Meal	

B. Fodder for Oxen at Moderate Work.

No. 7.	*No. 8.*	*No. 9.*
20 Good meadow hay	20 Medium Timothy	12 Good meadow
6½ Corn meal	2 Coarse bran	13 Oat straw [hay
	4 Corn meal	3 Linseed cake
No. 10.	*No. 11.*	*No. 12.*
12 Clover hay, best	12 Clover hay, good	10 Clover hay, best
10 Rye straw,	10 Wheat straw	14 Oat straw
22 Potatoes	7 Wheat bran	20 Mangolds
		1 Cotton-seed meal

C. Fodder for Oxen at Severe Work.

No. 13.	*No. 14.*	*No. 15.*
20 Best meadow hay	17 Clover, good	25 Medium meadow
10 Corn meal	3 Wheat bran	3 Wheat bran [hay
	10 Corn meal	3 Linseed cake

D. Winter Fodder for Milch Cows.

No. 16.	*No. 17.*	*No. 18.*
20 Best meadow hay	20 Good clover	17 B'st meadow hay
5 Wheat bran	20 Beet pulp	16 Corn stalks
3 Palm-nut meal	2 C'tton-seed meal	3 Wheat bran
		2 Cott'n-seed meal
No. 19.	*No. 20.*	*No. 21.*
10 Clover hay, best	20 Hungarian hay	20 Clover hay, best
15 Poor Timothy	20 Mangolds	2½ Wheat bran
20 Turnips	3 Wheat bran	50 Turnips
3½ Linseed cake	2 Linseed cake	
No. 22.	*No. 23.*	*No. 24.*
10 Best meadow hay	20 Clover hay, med.	20 Clover hay, best
15 Wheat straw	30 Mangolds	30 Turnips
5 Wheat bran	4 Malt sprouts	6 Corn meal
3½ Cotton-seed meal		

Fodder for Growing Cattle, one to two years old.

No. 25.	*No. 26.*	*No. 27.*
15 Med. meadow hay	20 Oat straw	15 Medium meadow
18 Rye straw	30 Turnips	20 Corn stalks [hay
2 Cotton-seed meal	5 Wheat bran	1¾ Meat scrap
	2 Cotton-seed meal	
No. 28.	*No. 29.*	*No. 30.*
10 Good clover	20 Poor meadow	20 Good meadow
10 Oat straw	20 Potatoes [hay	20 Mangolds [hay
8 Corn stalks	1¾ Dry ground fish	5 Coarse wheat
2 Cotton-seed meal		[bran

G. Fodder for Fattening Cattle.

No. 31.	*No. 32.*	*No. 33.*
22 Clover hay, best	20 Medium meadow	20 Good meadow
8 Corn meal	10 Oat straw [hay	100 Pumpkins [hay
	30 Mangolds	3¼ C'tt'n-seed meal
	3¼ Cotton-seed meal	
No. 34.	*No. 35.*	*No. 36.*
20 Best meadow hay	22 Best meadow hay	15 Clover hay, best
30 Sugar-beet pulp	50 Turnips	10 Barley straw
2 Linseed cake	5 Corn meal	40 Mangolds
		3 Linseed cake

Fodder for Sheep, producing wool.

No. 37.	*No. 38.*	*No. 39.*
15 Clover hay, good	10 Medium hay	20 Pea straw
10 Poor hay	15 Bean straw	20 Potatoes
3 Oats	4 Corn	2 Cott'n-seed meal
No. 40.	*No. 41.*	*No. 42.*
20 Oat straw	10 Best clover	20 Poor mead'w hay
30 Mangolds	10 Barley straw	6 Clover hay, best
1¼ Dried flesh	1½ Fish scrap	4 Corn

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Fencing and Fences.

This important subject comes home to every owner of a farm or of a village lot that requires enclosure. At a meeting of New Hampshire farmers, several gentlemen publicly offered to sell their farms for less than what the existing fencing on them had cost. In a recent address at an Agricultural Convention, Mr. A. W. Cheever, editor "N. E. Farmer," said he had carefully gone over the statistics of farms, animals, crops, and cost of fences, and found that: "It takes, on the average for the whole country, $1.74 worth of fences to keep $1.65 worth of stock from eating up $2.45 worth of crops."

Fig. 1.

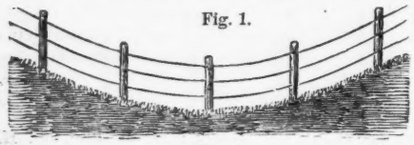


Fig. 2.

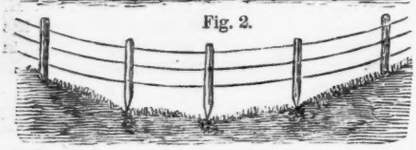
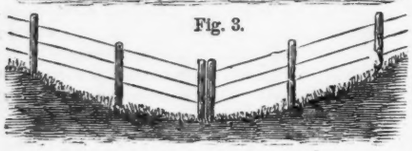


Fig. 3.



Nine years ago the statistics gathered at Washington showed that the fences then in existence, had cost $1,747,549,931. The additions since have raised the cost of the present fencing of the country to fully **$2,000,000,000.** A million dollars is a pretty large sum to count, or even to conceive of, (we can not count one million in the working days of a month, counting one a second and 10 hours a day), but here are two thousand such millions. The interest and repairs amount to over $200,000,000 a year, and the rebuilding of decaying fences nearly as much more, making our annual fence tax far more than the entire cost of the Army, Navy, the General Government expenses and Pensions, together with the interest on the public debt.

In N. Y. State, for example, there are some 75,000 miles of roads requiring 150,000 miles of fencing, costing over $40,000,000, and the total fencing in this single State has cost not less than $230,000,000.

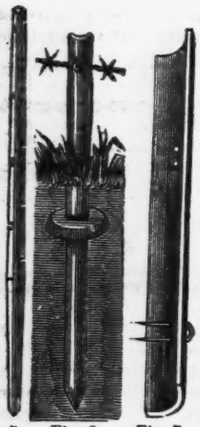


Fig. 5. Fig. 6. Fig. 7.

During 38 years past the *American Agriculturist* has had not a little to say as to the uselessness of a good deal of the fencing. But much will be needed wherever live animals are kept, and we propose now to direct some effort to reducing the cost of fencing generally. If this one item in the United States can be reduced only one-fourth, the saving will amount to $500,000,000. In the older States, there are an average of about two miles of fencing for each 100-acre farm, costing about $1 a rod, or $640. If, in building new fences and replacing old ones, we can erect them at ⅓ to ½ the cost of the present fences, and have those that will last two, three, four or more times as long, and require but small annual repairs, the average value of farms will be enhanced some hundreds of dollars at least. If a narrow effective fence can take the place of the ordinary "worm fence," there will be a great decrease in the production of weeds and foul plants. Two miles of such fence on a farm, occupying a strip 8½ feet wide with its projecting corners, wastes two full acres of ground, worth $150, or more. The cost of Iron, and recently of Steel, are greatly reduced, and they have come into very largely increased use in ship-building, house-building, etc. Why should they not take the place of wood in all varieties of fencing, both for posts and rails? Such a change is already rapidly taking place.

Fig. 4.

Fig. 8.

More than 100,000 *miles* of *Barbed* Wire Fence have been recently erected. Whether this style of fencing is best, or desirable; whether it is too *barb*arous or not, for general adoption over our vast, timberless prairies at the West, and what forms can be adopted in our more thickly settled regions, for highway fences, for village lot enclosures, etc., will be the subject of examination and discussion in this and especially in future papers.

A Call for Information.

Many of our readers have the new barbed fences. We earnestly invite accounts of their experience and observation, *pro* and *con*. We have some letters denouncing barbed wire fences as too cruel to be permitted, and insisting that they should be prohibited by law along highways and railways. Others speak of their introduction as of inestimable value. Let us have all possible testimony on *both* sides of the question. Also any information and suggestions about *iron* posts.

Iron Fence Posts.

As there is a pressing need of new and improved forms of *Iron* Fence Posts, in order to call out information and stimulate invention in this direction, we will first briefly introduce this branch of the subject, by giving illustrations and descriptions of a few of the forms that have come under our own notice. The simplest form is an iron bar, or an iron tube, with holes or staples for attaching the horizontal wires. The same weight of iron is stronger in the form of a tube than in a solid bar. But cast-iron will be likely to be used generally. After securing sufficient *strength* of post above ground, the next points to be aimed at are *light weight*, on account of expense, and breadth of resisting surface in the soil to prevent swaying in any direction. Non-liability to heaving by frost is also an important point.

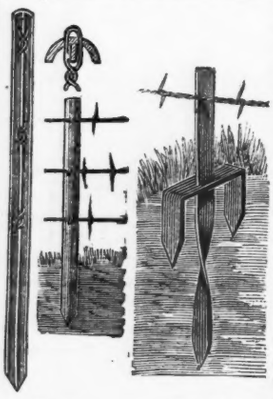


Fig. 9. Fig. 10.

And just here we will introduce a matter referred to by a correspondent, who writes that a fatal objection to all forms of wire or barbed wire fence for uneven ground, is, that when the fence runs across a hollow or depression of the surface, as in figure 1, the contraction of the wire by cold lifts out the lower posts, as indicated in figure 2, even if the depression be only 2 or 3 feet, if the wires are tight. We suggest, as a remedy, two independent posts together at the lowest point, as shown in figure 3.

Various Forms of Iron Posts.

Andrew Turner, of Bellona, N. Y., writes us, describing a form of iron post, of which the exact form is not quite clear. He gives one suggestion that may be useful wherever there are plenty of stones of *so soft a texture as to be easily drilled*. During winter, or other leisure seasons, he drills holes in them of a size to admit the foot of the iron post, of whatever form, say 6 inches in depth. The stones are put into the ground any desired depth, and the posts inserted. The posts may then be of any iron pipe. We suggest using flat stones 3 to 6 inches thick, and drilling the holes *through* to let the posts extend some distance into the soil below.

John Cunningham, of Luzerne Co., Pa., sends us sketches of an iron fence post devised by him, to be made of cast or rolled iron, with double angles, as shown by the cross section at figure 4. The post, shown in fig. 5, has holes for 4 or 5 wires. The holes are made so as to receive the wires which are held fast by a key — in this case a common nail of proper size, driven above the wire. To prevent loosening by contraction and expansion of the wire, we suggest driving a nail from *each* side, one above and one below the wire.

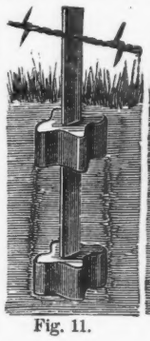


Fig. 11.

Fig. 12.

An iron post made by the Iowa Barbed Wire Fence Co., is shown at fig. 6. The bar of iron is ¼ inch thick and about 2½ inches wide, curved so as to stiffen it, (fig. 7). The wires are held on the outer curved side by staples over them to be clinched on the concave side. To hold the post firmly, a disc, (fig. 8), is sunk in the ground at any desired depth, and the post driven through the curved opening in it made to just fit the post. This disc is of 5/16 inch iron, 6½ inches in diameter, besides the edge of it, which is turned down 1½ inch all round.

J. C. Taylor, of Chicago, has an iron post (fig. 9) of similar construction to the above, but strengthened by a flange in the curve. This is driven into the ground without any boring. The method of attaching the wire is shown in the small cross section engraving at the top of figure 9.

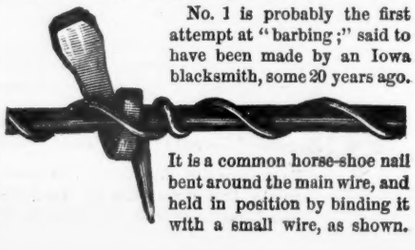
The Bullard iron fence post (fig. 10), made by the Washburn & Moen Manufacturing Co., is a flat bar slotted on one edge to receive the wires, and held by a forked brace driven into the ground.— Brick tiles of the form shown in fig. 11, are also used as support to strengthen this post. — The same company make a post of angle iron (fig. 12) which is braced in the line of strain. The wires are clamped by a keyed sliding holder, shown in figure 13.

Fig. 13.

The Barbed Wires.

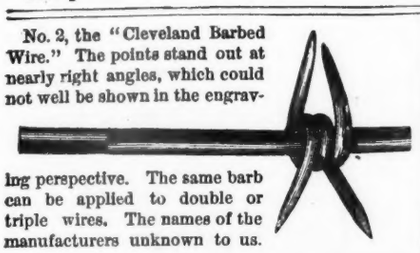
Many attempts have been made to imitate the natural thorn-armed plants, by affixing barbs to wire, and over 30 different patterns have been devised. We have some 25 specimens, the exact size and form of which are shown in the engravings below. Nearly all the fence wires here described, are now made of Steel, and most are supplied either painted (or japanned), or galvanized (coated with zinc). They average about 1 lb. per rod per wire, and usually cost 9 to 13 cents per pound.

The engravings are so exact that our readers can almost decide and make their own selection. We confess to being yet in the condition of a learner— but an earnest, investigating one, in behalf of the public. We started with a prejudice against any of the severer forms of barbs; yet some manufacturers say the demand is for the longest barbs, especially at the far West. We intend to learn more and say more on this, especially when we hear further from our readers experienced in their use.

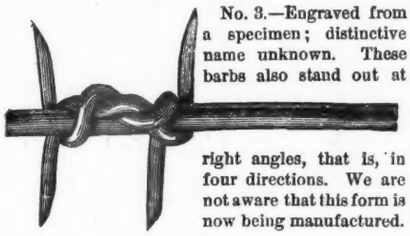


No. 1 is probably the first attempt at "barbing;" said to have been made by an Iowa blacksmith, some 20 years ago. It is a common horse-shoe nail bent around the main wire, and held in position by binding it with a small wire, as shown.

No. 2, the "Cleveland Barbed Wire." The points stand out at nearly right angles, which could not well be shown in the engraving perspective. The same barb can be applied to double or triple wires. The names of the manufacturers unknown to us.

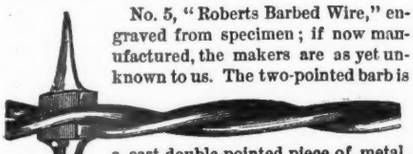


No. 3.—Engraved from a specimen; distinctive name unknown. These barbs also stand out at right angles, that is, in four directions. We are not aware that this form is now being manufactured.

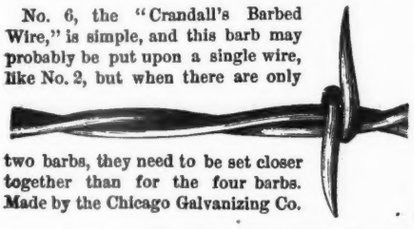


No. 4, the "Kelly Steel Barb Wire," with the two-point barb stamped or cut from sheet metal, and pierced to string upon one main wire and be held in place by the other. This variety is manufactured by the "Thorn Wire Hedge Co.," we believe.

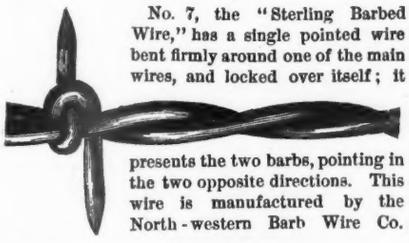
No. 5, "Roberts Barbed Wire," engraved from specimen; if now manufactured, the makers are as yet unknown to us. The two-pointed barb is a cast double-pointed piece of metal, with a deep groove around its middle, where it is grasped and held somewhat firmly by the twisted main wires.



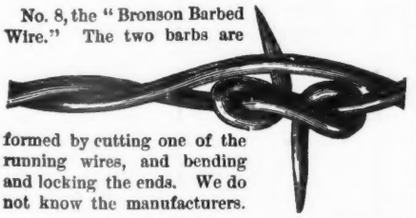
No. 6, the "Crandall's Barbed Wire," is simple, and this barb may probably be put upon a single wire, like No. 2, but when there are only two barbs, they need to be set closer together than for the four barbs. Made by the Chicago Galvanizing Co.



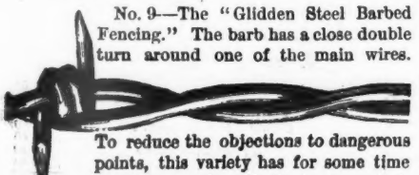
No. 7, the "Sterling Barbed Wire," has a single pointed wire bent firmly around one of the main wires, and locked over itself; it presents the two barbs, pointing in the two opposite directions. This wire is manufactured by the North-western Barb Wire Co.



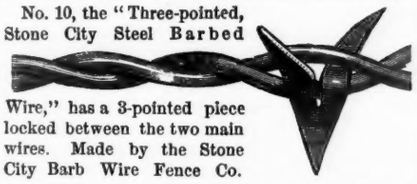
No. 8, the "Bronson Barbed Wire." The two barbs are formed by cutting one of the running wires, and bending and locking the ends. We do not know the manufacturers.



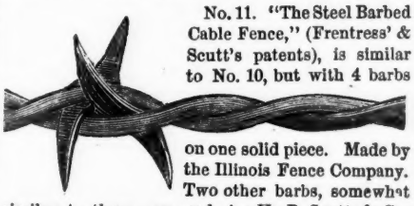
No. 9—The "Glidden Steel Barbed Fencing." The barb has a close double turn around one of the main wires. To reduce the objections to dangerous points, this variety has for some time past been made with the barbs materially shortened. Manufactured by the Washburn & Moen M'f'g. Co., as per advertisement elsewhere.



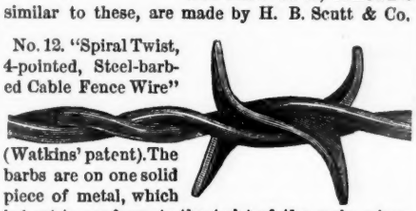
No. 10, the "Three-pointed, Stone City Steel Barbed Wire," has a 3-pointed piece locked between the two main wires. Made by the Stone City Barb Wire Fence Co.



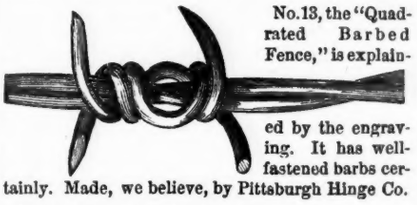
No. 11. "The Steel Barbed Cable Fence," (Frentress' & Scutt's patents), is similar to No. 10, but with 4 barbs on one solid piece. Made by the Illinois Fence Company. Two other barbs, somewhat similar to these, are made by H. B. Scutt & Co.



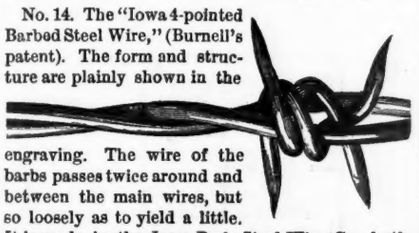
No. 12. "Spiral Twist, 4-pointed, Steel-barbed Cable Fence Wire" (Watkins' patent). The barbs are on one solid piece of metal, which is bent to conform to the twist of the main wires, and is thus held fast. Made by Watkins & Ashley.



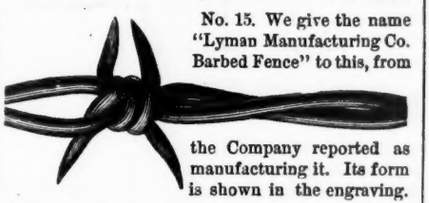
No. 13, the "Quadrated Barbed Fence," is explained by the engraving. It has well-fastened barbs certainly. Made, we believe, by Pittsburgh Hinge Co.



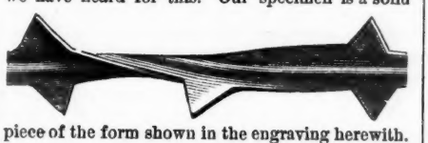
No. 14. The "Iowa 4-pointed Barbed Steel Wire," (Burnell's patent). The form and structure are plainly shown in the engraving. The wire of the barbs passes twice around and between the main wires, but so loosely as to yield a little. It is made by the Iowa Barb Steel Wire Co., both in Iowa and New York, as advertised elsewhere.



No. 15. We give the name "Lyman Manufacturing Co. Barbed Fence" to this, from the Company reported as manufacturing it. Its form is shown in the engraving.

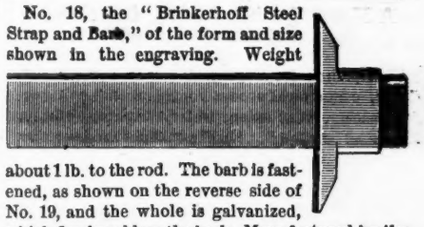


No. 16. The "Allis Patent Barb," is all the name we have heard for this. Our specimen is a solid piece of the form shown in the engraving herewith.

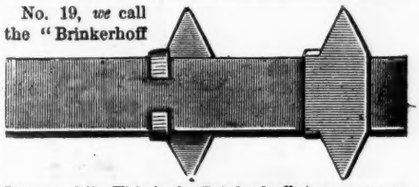


No. 17, the "American Barb Fence." A central, wire closely sheathed with a continuous metal strip, with its edges cut in the form of barbs, turned out in all directions, the points one inch apart. The whole is covered and saturated with paint or zinc, firmly cementing the outer and inner metal. Made by the American Barb Fence Co., (J. C. Taylor, General Agent), as advertised elsewhere.

No. 18, the "Brinkerhoff Steel Strap and Barb," of the form and size shown in the engraving. Weight about 1 lb. to the rod. The barb is fastened, as shown on the reverse side of No. 19, and the whole is galvanized, which firmly solders the barb. Manufactured by the Washburn & Moen Mfg. Co., as advertised elsewhere.

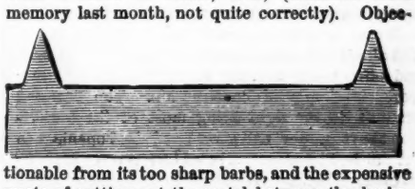


No. 19, *we* call the "Brinkerhoff Improved." This is the Brinkerhoff strap, same as No. 18, but the barbs, which were prepared *in this form* at our suggestion and request, project only about one-fourth of an inch, and the edges are so inclined that they will not catch and tear the skin of animals unless pushed horizontally under heavy pressure, nor will they injure clothing swinging loosely against them.

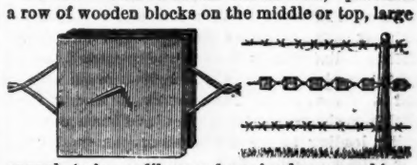


Others claim strongly that the barbs are not long enough or sharp enough to repel cattle. That is one of the points to be decided. Indeed, *the* leading question in the discussion now is, how much, or how little barbing is best, taking into account *effectiveness*, and *safety for animals*. No. 20 is a partial section of No. 19, which is introduced to show how it is twisted in putting up.

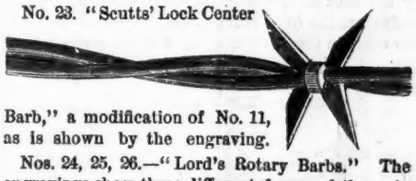
No. 21 is from the actual piece we brought from a fence at Beloit, Wis., (sketched from memory last month, not quite correctly). Objectionable from its too sharp barbs, and the expensive waste of cutting out the metal between the barbs.



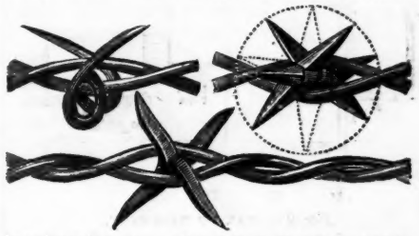
No. 22. "Scutt's Patent Tablet Wire," provides a row of wooden blocks on the middle or top, large enough to be readily seen by animals approaching.



No. 23. "Scutts' Lock Center Barb," a modification of No. 11, as is shown by the engraving.



Nos. 24, 25, 26.—"Lord's Rotary Barbs." The engravings show three different forms of these, in which the barbs are arranged to turn or revolve loosely in the wire. The claim is that they yield to the motion of the animal, and lessen the tearing.



Some other forms will be shown next month.

A House Costing $4,000, Complete.

BY S. B. REED, ARCHITECT, 245 BROADWAY, N. Y. CITY.

This plan is for a commodious, convenient residence, economically constructed with appliances for heating, ventilation, water, etc., complete.... **Elevation.**—(Fig.1.) The outlines are irregular,

Fig. 1.—FRONT ELEVATION—FACING EASTWARD.

and agreeably conform to the site for which it is planned—an elevated, undulating and picturesque point, fringed with forest trees, and overlooking the waters. It fronts eastward, bringing the Conservatory on the warm, or southern side. The position of the tower, and its size, make it a prominent feature, and very valuable for an elevated outlook commanding extensive and interesting views. The aim is to have the exterior ornamentation neat and effective, and being mostly of open timber work, is simple of construction. The inclined grounds to the right bring most of the foundation above ground, and gives good sized openings to the finished basement....**Cellar and Basement.**—(Fig. 2.) Hight of walls in main part 7 feet; in the kitchen end 8 feet, when floored 7 feet. That under the main part is for cellar purposes, to contain the furnace; bins for fuel and vegetables, with six small windows for light and air. The kitchen cellar part is floored and plastered, well lighted, contains a range, boiler, sink, wash tubs, and a force-pump. The pantry adjoining the kitchen is shelved on three sides, and has a dumb-waiter leading to the dining-room pantry above. The outside entrance to the kitchen and cellar is by the area at the rear. A convenient stairway leads from the front entry in the basement to the rear entry in the first story....**First Story.**—(Fig. 3.) Hight of ceiling in main part, 10 feet;

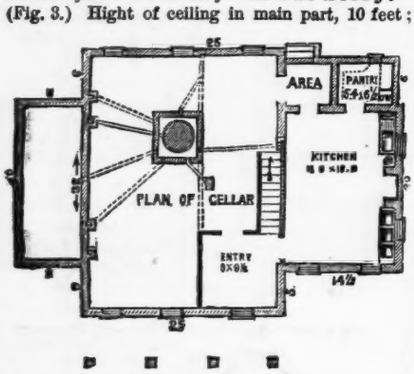


Fig. 2.—PLAN OF BASEMENT.

in the wing 9 feet. The principal entrance has double front and vestibule doors, to a large hall, 9½ by 18½ feet. Small closets at each side of the vestibule serve for umbrellas, overshoes, etc. At the left, double doors, leading to the parlor, and further on a door leads to the library, at the right, one to the dining-room, and one at the rear, to the back entry. The parlor is of ample size, and adjoins the library through sliding-doors. Each of these rooms has hard-wood mantels, is well lighted from without by large windows, and both have sash-doors leading to the conservatory. The latter is finished with a concrete bottom, and altogether costs but $150. By a little effort at selection and arrangement of plants, this apartment may be made a constant source of interest and pleasure. The dining-room has outlooks in three directions, and communicates directly with the porch, hall, the rear entry, and a pantry having a dumb-waiter to the basement. The rear entry is cut off from the main hall (to save the latter from much common use and wear,) and has a wash-bowl, and stairs leading to the basement. The rear porch, and dining-room pantry are both under a roof similar to that shown for the front piazza; the pantry extending to the outer face, forms an alcove of the porch. The main stairs to the second story are of the "quarter circle" pattern, with niche near the top, and have a 10-inch panelled newel; a 2½ by 4½-inch moulded rail; and 2½-inch fluted ballusters, all of hard wood....**Second Story.**—Fig. 4.) Hight of ceiling in main part 9 feet; in wing 8 feet. The divisions are: a hall, three chambers, a bed-room, bath-room, and six closets, all of ample dimensions. Mantel shelves with trusses of hard woods are put in each chamber. The stairs to the

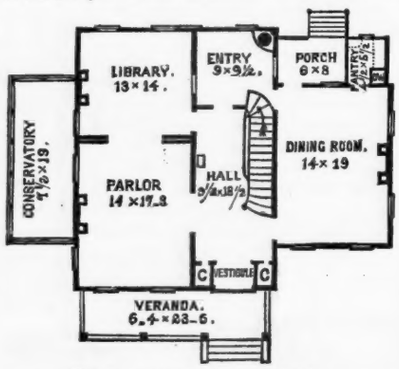


Fig. 3.—PLAN OF FIRST STORY.

attic are placed above those of the first story, which are thus made continuous to the upper hall. ....**Attic.**—(Fig. 5. Hight of finished ceiling 9 feet. This is divided into a hall, two chambers, a bed-room, and two closets. The stairs to the tower are "boxed in" with narrow, double-dressed beaded ceiling, and have a panelled door at the foot....**Tower.**—Size of floor plan (not shown), 9½ feet square. Hight of side walls to top of plate 6 feet, and continued along the under side of the rafters at an angle of 45° to the ceiling, which is 9 feet high. The boxing of the attic stairs extends 2 feet above the floor, and has a moulded cap along the top....**Construction.**—Foundation walls of hard brick and good mortar. Cellar bottom is levelled with concrete. The frame is of seasoned spruce. Inclosing of first quality pine clap boards laid on felt and dressed sheathing. Roofing of "Chapman" slate, laid on tarred felt and sheathing. Gutters and leaders of IX tin. Floors of narrow spruce. Plastering, three coats, hard finished. Casings and mouldings of clear pine. Doors all panelled and moulded. Sash of best make, four lights to each window, and hung to balance weights. Blinds to each window above the foundation; shutters to kitchen windows. Painting, two coats of best materials. The hard woods oiled. Plumbing; the tank (not shown) placed in the hall of the attic, just over the bath-room, is 3 by 4 by 6 feet, lined with lead; bath-tub, seat-closet, and wash-bowl in rear entry; range, boiler, sink, wash-tubs, and a force-pump in the kitchen; all connected with proper lead pipes for hot and cold

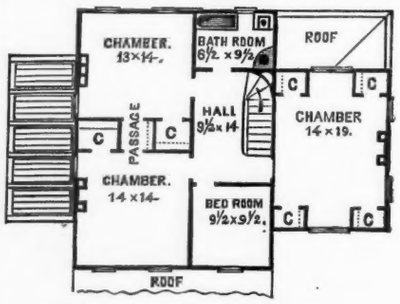


Fig. 4.—PLAN OF SECOND STORY.

water. A 4-inch soil-pipe leads from the bath-room to a 5-inch drain of vitrified tile pipe conveying all waste to a cesspool 50 feet from the house. The soil pipe is ventilated by a pipe leading from it to above the roof with a T connection at the top. The heater is inclosed with brick, and has pipes to convey warmed air to the halls and rooms of the first and second stories. Bells from the front door to the rear entry; and from the second story hall to the attic and kitchen, are put in with wires passing through tubes concealed from sight. Speaking-tubes are put in, leading from the dining-room to the kitchen. The contract requires all done in a workmanlike and substantial manner, and of materials best adapted to their several purposes....**Cost.**—Any one at all familiar with building, will, by going over the following *items of cost*, learn the character of this house. The total of these items might easily be doubled if desirable, without changing the plans in the least, simply by increasing the expense in the details of finish. Whenever employed to prepare plans, my first inquiry is as to the amount to be appropriated for building, then to ascertain the accommodation required, the facts as to site, learn all I can of the characteristics, and tastes of the owner and his family, then prepare plans to meet the requirements, without exceeding the amount set down to be expended. *Cost* of materials and labor, viz.:

132 yards excavation, at 20c. per yard	$ 26 40
24 M. Brick (furnished and laid), at $12 per M.	288 00
80 feet Blue Stone, at 15c. per foot.	12 00
1,250 yards Plastering, at 25c. per yard	312 50
240 feet Cornice, at 30c. per foot.	72 00
84 yards Concrete, at 30c. per yard	25 20
5,500 feet Timber, at $15 per M.	82 50
200 Joist, at 15c. each	30 00
350 Wall Strips, at 11c. each	38 50
550 Flooring inside, at 18c. each	99 00
50 Flooring outside, at 25c. each	12 50
520 Sheathing, at 15c. each	78 00
500 Clap-boards, at 20c. each	100 00
Outside Cornices	45 00
27 squares Slate, at $9 per square	243 00
270 feet Gutters and Leaders, at 10c. per foot	27 00
Verandah and Porch (complete)	60 00
600 lbs. Nails, at 3c. per lb.	18 00
7 Cellar Windows (complete), at $4 each	28 00
4 Kitchen Windows (complete), at $6 each	24 00
23 Plain Windows (complete), at $8 each	184 00
11 Dormer Windows (complete), at $12 each	132 00
45 Doors (complete), at 7 each	315 00

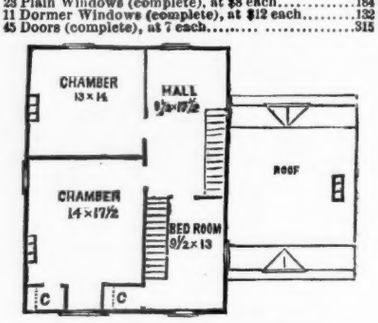


Fig. 5.—THIRD STORY, OR ATTIC.

4 Stairs (complete)	100 00
8 Mantels and 6 Shelves, $108; Plumbing, $400	508 00
Furnace, etc., $250; Conservatory, $150	400 00
Bells, Speaking Tubes, $19; Carting, $30	49 00
Painting	350 00
Carpenter's labor not included above	400 00
Incidentals	140 40
Total	$4,000 00

A Distinguished Immigrant.—Professor Baird's European Carp.

In 1876, Professor Baird, U. S. Commissioner of Fisheries, having for a long time understood the importance of acclimating the Carp in this country, engaged an eminent German fish-culturist, Dr. Rudolph Hessel, to bring over a supply of the best varieties of this favorite European food-fish. The first experiment, in May, 1876, was unsuccessful, owing to the extremely high temperature encountered on the passage, and out of 300, with which he started, only four survived. Another unsuccessful attempt was made in December of the same year, and seven more were brought from Hungary, a large number having died on the passage. In May, 1877, Dr. Hessel returned from a third trip, bringing to New York 345 young carp, 227 of which were of the varieties known as the "Leather Carp" and "Mirror Carp," and 118 of the common or "Scale Carp." The U. S. Fish Commission was not ready to receive them, and they were placed for a time in ponds prepared for their reception in Druid Hill Park, Baltimore, under the superintendence of Major T. B. Ferguson, Maryland Commissioner of Fisheries. Here they throve and increased rapidly in size, and in May, 1878, one hundred and twenty were removed to the Government Carp Ponds, built for them on the Washington Monument Reservation, in the City of Washington. These ponds, a plan of which is given below, are constructed after the best German models, and cover about twelve acres of land, in the vicinity of the Washington Monument.

The Carp have now multiplied to such an extent that it is possible to begin the work of distributing them, and, by the time this number of the *American Agriculturist* reaches its readers, Prof. Baird's messengers will have carried cans of young carp to all parts of the United States. The introduction of this new food-fish will be of great interest and importance to all inland communities, for there is no ditch, pond, or mill-dam, or any boggy, muddy spot, which can be converted into a pond, in which they will not thrive. It will be strange if, within twenty years, carp do not become as common domestic animals as ducks or pigeons. Through the courtesy of Prof. Baird we are able to present an excellent engraving of the new fish, with which, before long, many of our readers will doubtless become more directly acquainted.

The Carp belongs to the family known to naturalists as the *Cyprinidæ*, members of which are to be found in every stream and pond in North America. Good examples of this family are the common Goldfish, and the familiar brook species known everywhere by such names as "Dace," "Chub," "Red-fin," "Fall-fish," and "Shiner." The "Buffalo-fish" of the West is also said to resemble it in many respects. The Carp, however, is the king of his tribe, and those who know, do not hesitate to say that, as a food-fish, it far excels the best of them. "In Paris, Berlin, and Hamburg," writes Dr. Hessel, "in spite of an abundant supply of different salt and fresh-water fishes, the carp is always preferred to these, and, with the exception of the trout and salmon, it frequently commands a price three times as high as that of all the rest." Artificial culture, continued through many centuries, has developed in the carp a number of varieties, as strongly marked as those of sheep, dogs, pigeons, or other domestic animals. These are divided into three groups: the "Scale Carp", which most closely resembles the original form, having scales like ordinary fishes, and has four thread-like appendages, or barbels, under the chin; the "Mirror Carp" has extraordinarily large scales, which run along the side of the body in three or four rows, the rest of the body being bare; and the "Leather" or "Naked Carp," which is almost destitute of scales, having only a few along the line of the back, and has a thick, soft skin, which is velvety to the touch. Both the latter varieties are said to be much superior to the Scale Carp, which is best known, in flavor, hardness, and adaptation to confinement. A claim has been made that carp were introduced into America, and particularly into the Hudson River, many years ago, but this is quite unsubstantiated.

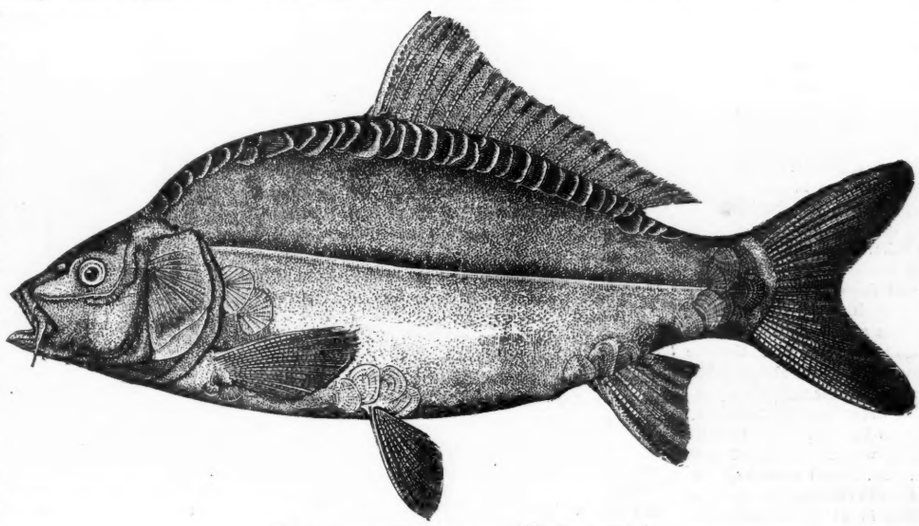


Fig. 1.—THE EUROPEAN CARP (*Ciprinus carpio.*)

The Carp has other and strong recommendations: *It is, of all fish, the most readily propagated and reared.* It has been domesticated in Europe from time immemorial, having been introduced many centuries ago from Central Asia or China, where it is native. Carp soon become tame and eat from the hands of their keeper; Dr. Hessel handles those in the Government ponds as if they were tame kittens, and says that they come to him when he whistles. Their fecundity is great. A fish weighing four or five pounds lays 400,000 to 500,000 or more eggs, and one of ten or fifteen pounds about 1,500,000. In Middle Europe they spawn from May to August, and the breeding season appears to be nearly the same in Washington: In 1879 they spawned here from June to September. The eggs are sticky, and cling to plants and twigs, hatching in from nine to eighteen days, according to temperature. The actual rate of increase is very great, owing in part to the fact that the parents do not devour their young. The 120 fish brought to Washington two years ago have increased to, at least, 20,000. *It is thus able to populate a body of water to the fullest extent*, filling up the available space with their own kind, while carnivorous species require that a large number of other fishes on which they may prey inhabit the waters with them. *Unlike the majority of American food-fishes, their diet is largely vegetable*, and they are particularly fond of watercresses and other juicy plants. They grow fat upon the *algæ*, commonly called "Frog-spittle," which covers quiet waters. They also devour worms and insect-larvæ, which they root out of the mud, and all kinds of refuse matter, such as the offal of kitchens, slaughter-houses, and breweries. By reason of these habits, *they are harmless to other fishes inhabiting the same waters.* "The food-fish indigenous to the United States," says Prof. Baird, "which has been most widely distributed in the smaller ponds and lakes, is the Large-mouthed Black-Bass. This fish is very carnivorous, preying upon almost all species in the same waters. Even the Pickerel is said to decrease rapidly when *in contact* with it. The necessity for fish-food is always a bar to a great increase of numbers among fishes, particularly in

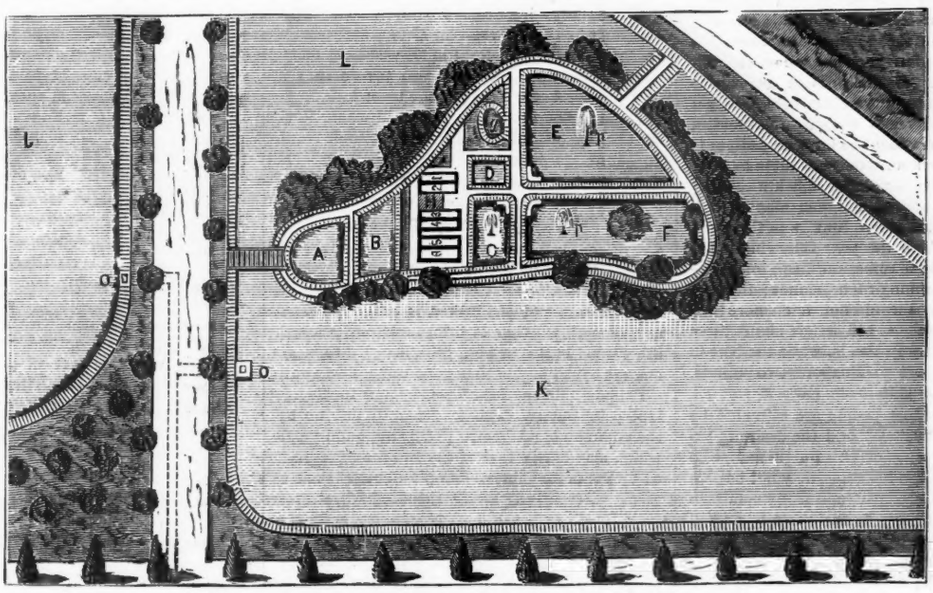


Fig. 2.—PLAN OF GOVERNMENT CARP POND, WASHINGTON, D. C.

A, B, C, D, E, and *F,* Hatching Ponds; *G,* Turtle Pond; *H,* Watch House; *J,* East Pond; *K,* North-west Pond; *L,* South-west Pond; *O, O,* Outlets; *P, P,* Fountains.

small bodies of water." Carp, on the other hand, introduced into new waters, fills a vacancy, and not only do not decrease the number of other fishes, but by supplying them food, enable the existence of a large additional number of carnivorous fishes.

The Carp is adapted to very varied climates, and will thrive under conditions unfavorable to any equally palatable American fish. They are equally at home in lakes or streams, and in the merest puddles and ditches, and are found in the latitude of St. Petersburg as well as in Italy and Northern Africa. It is believed that they will excel all others for propagation in ponds and other sluggish waters north and south, now either barren of life or inhabited by a limited number of pickerel, cat-fishes or sun-fishes.

It is very hardy in all stages of growth.—"The Carp is able," says Dr. Hessel, "to live in water where other fishes could not possibly exist—for instance, in the pools of bog-meadows or sloughs."—Though it is not to be inferred from this that the best Carp-ponds should be thus located. In Silesia, puddles two or three feet deep, in the villages, are used for raising two-year-old Carp for stocking distant waters. From this resource a single estate realized what would amount to about $55 to the acre of pond surface. In Europe, Carp are always taken to market alive, in tanks or barrels, and, if they are not sold, returned to the water alive at the end of the day. They are said to be kept alive in cellars in the winter, wrapped in wet moss and fed upon bread soaked in milk. Dr. Hessel once kept one this way five weeks. In cold climates they protect themselves from freezing in winter by retiring in groups of 50 to 100 or more, into cavities in the muddy bottom called "kettles," where they pass the time until spring, huddled together in concentric circles, with their heads together, the posterior part of the body raised and held immovably, scarcely lifting the gills for breathing and without taking a particle of food. This abstinence and torpidity lasts in cold countries six or even seven months, and thus they can live out a very rigorous winter.

Its growth is very rapid.—Dr. Hessel says that in Central Europe its growth is entirely suspended in the winter, the increase in weight taking place from May to August, and especially in July. The rate of growth depends upon many things—the temperature of the water, the quality and quantity of food, the nature of the bottom. In rivers and lakes they attain the greatest size. The rapidity with which Professor Baird's fish have grown surpasses anything hitherto known, and indicates that the Carp is particularly well adapted to America. The normal weight to which the Carp may attain in three years in Europe is an average of three to three and three-fourths pounds; that is, a fish which has lived two summers, and is eighteen months old, will weigh from two and three-fourths to three and three-fourths pounds in the year following. Dr. Hessel states that the Washington Carp, four summers old, now weigh nine or ten pounds; those of the same age in Europe would not weigh more than four; those three summers old weigh about three and three-fourths or four pounds, while the best in Europe of the same age weigh about two pounds.

Large Farms.—Most people are attracted by the show of a great business, and the desire to extend operations is very general. But a man who can successfully manage 100 acres, may not be able to run a 500 or 1,000-acre farm, and many men who can profitably work a farm by their own labor, fail when they try to do so by hired help. To so manage a number of working men that every hour's work of each shall be made to concentrate upon one desired object, requires much ability. For want of this, many who have become "well off" on a small farm, have failed on a large one where they have had to employ help. A man may be worthily ambitious of success in business, but before he leaves a small farm, for one much larger, he should be satisfied of his ability to manage it. It is not a new thing for a man to be *land*-poor, even though the land itself is of good quality. As with extensive and overgrown nations, large farms might sometimes be of more value to all concerned if they were divided up and each part put under a partial or entirely separate management.

Among the Farmers.—No. 48.

BY ONE OF THEM.

How Butter Goes to Market.

Almost all over the country butter which is made in farmers' families in excess of their requirements, goes to the country store in exchange for sugar, tea, coffee, and spices. It is, of course, of all colors and textures and qualities, usually wrapped, or partially wrapped, in old and well-worn muslin, upon which, if "seam and gusset and band" are not apparent, the suspicion of them is. It is in lumps of ovoid form, usually weighing one to three pounds. The country store-keeper selects the best for his own immediate sales to village people; the rest is graded and packed, according to color and quality, in "Welsh tubs," or whatever other package will best suit the market. An enormous quantity of butter finds its way to market in this way, and forms the lower grades. Such butter can not be depended upon to keep, unless, indeed, the grading and repacking be done with extraordinary care; then it may prove tolerably good.

Among farmers who are really dairy folks, the butter is packed for market as soon as it is made. The expense of tubs, or pails, and firkins, (and these words are used technically with rather forced significations,) is considerable. What are known as

"Welsh Tubs"

are ash, oak, or spruce pails, without bails, but with close covers. They hold, usually, 20, 30, and 50 pounds. These are the most convenient packages for shipping to a distance, because they are not to be returned; and though they cost only about a cent a pound for the butter they contain, yet dairy folks find it cheaper to pack and ship their butter in "*return pails*" of some kind. These are of a great variety of styles and sizes. The common, and, as a rule, the best size, is the 50-pound package. It usually holds several pounds more, but not the regular 56 pounds, which is a "firkin" in Great Britain. Shipping tubs, holding just this weight, are coming into use somewhat. But the notion is growing that it is best to adhere to the decimal system, and ship abroad in tubs that will hold but 50 pounds, and in what we call *firkins*, that is, in kegs holding 100 pounds. These packages are of oak, and are very strong and neat, and are brine and butter-tight in all weathers and climates; I may add air-tight, also, for so they are, in the general acceptance of the term.

These packages are manufactured where lumber of the best sorts is accessible, and the trade requires an enormous quantity in the aggregate, especially since much lard is packed in them, or in packages closely resembling those used for butter.

"Fancy Butter" Packages

are, of course, of many forms, as each maker wishes his butter to be both attractive and unique. All "print-butter," or butter in small packages marked with the name of the maker, is properly regarded as "fancy," whether it bring a higher price than other good butter or not. Still, it ought to be good enough to sell higher than good tub or firkin butter.

Philadelphia has long been famous for its excellent print-butter. This is generally put up upon the common hand stamps (fig. 1) in pound "pats," which may have either of the two forms represented by the dotted lines. Simple devices, such as a sheaf of wheat, roses, pineapples, acorns, and oak leaves and nondescript leaves are common. Monograms or single letters are not rare, with occasionally a more elaborate device. These "pats," for they are patted into form upon the stamps, are marketed in what are known as Philadelphia tubs, which are oval tubs of cedar, lined with tin, and having ice chambers in each end, having a nearly rectangular space in the center, in which the butter is packed upon shelves 2½ to 3 inches apart. Butter packed over night, the ice chambers being filled with a freezing mixture, and refilled in the morning with simple ice, will go 48 hours in ordinary summer weather without softening. The covers lock down, and the tubs are often cased in quilted or felt jackets.

Fig. 1.—HAND STAMP.

A good deal of butter is now made in rectangular (square or brick-shaped) prints, and shipped in

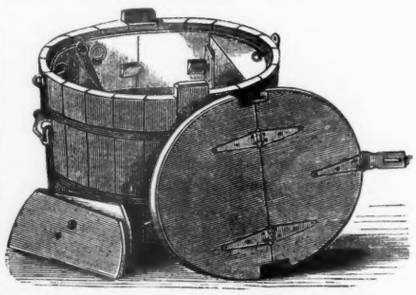


Fig. 2.—THE PHILADELPHIA BUTTER TUB.

these Philadelphia cedar tubs (fig. 2), or in square packages, with provision for ice in hot weather. One of the neatest of these is known as the Lancaster package. Its peculiarity is that tin cups, or boxes of tin, are provided for each print of butter, the prints being wrapped in pieces of muslin. The advantage offered by this package is, that the prints do not become marred in the hands of careless shippers and carriers, as is frequently the case.

One of the most ingenious applications of the new kind of veneering, cut in a continuous ribbon round and round the log, is the making of butter packages by the Bradley process. This is protected by several patents, and consists in *sewing* the bands of wood together, so as to make the sides of round (cylindrical) boxes or flaring pails, adapted to hold butter and similar articles, by having bottoms and covers attached by means of tin bands. Figure 3 shows a stack of these boxes, holding from ½ lb. to 10 lbs. They are made of spruce or of oak, and bear scalding in whey, and in brine, if desired, although these woods are so nearly tasteless that anything more than simple scalding seems unnecessary. These boxes are very strong, and inclose the butter nearly air-tight. They are made to be packed full of butter, a disc of wax paper or piece of muslin being laid over the butter. When the butter is to be used, the cover is removed, and the seam is ripped with a penknife, when the package may be opened and taken off from the butter, which is left in a solid cake. Figure 4 shows the crate in which these packages are packed, the whole being furnished at the low cost to the consumer of one cent per pound for the butter which the crate will hold. The pails (fig. 5) may be used for butter also, but are also well adapted for lard, oysters, sausage meat, etc., and both the pails and boxes are furnished, when so ordered, both water and grease tight by being dipped in hot paraffine, which is absolutely colorless, odorless, and tasteless, and insoluble in water or cold fats, and penetrates both the wood and the seams and joints.

Fig. 3.—BRADLEY'S BUTTER BOXES.

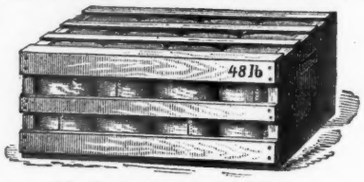


Fig. 4.—CRATE FOR SHIPPING.

The Burchard "Knock-down" Package.

This is also a new package, and it seems so well

adapted to its uses that it is sure to become popular. The term "knock-down" does not signify that this is a perfect *stunner*, but that it comes to pieces in such a way as to be packed in a small compass, and be readily reconstructed. It is intended solely for pound and half-pound rectangular prints, and as the butter in the case occupies but little more space than without, it admits of very close packing. Easy inspection, convenient delivery to customers, and perfect protection from the dangers of careless handling, are the objects supposed to be accomplished. Figure 6 represents a box holding one pound, with a paper gummed label about it, stating the name and address of the maker of the butter, and the dates at which it was made and shipped. The label being cut, the lid lifts off, and the box opens at any angle, as shown in figure 7, leaving the butter by itself in its wrapping of muslin or

Fig.5. BUTTER PAILS.

Wax Tissue.

This article, by the way, is a very neat and beautiful thing for many purposes. It is simply fine tissue paper, saturated with paraffine, thereby rendered water and grease-proof, as well as air-tight. If the butter wrapped in it be kept cold and be dry when wrapped, the paper is easily removed, but if warm or wet when wrapped, then the paper sticks to the butter of course—for the nature of the butter is not changed, and being long in contact with moisture softens the paper. When used with discretion, it is far preferable to muslin for wrapping print-butter, and much cheaper, and may be left in contact with the same indefinitely without harm to it.

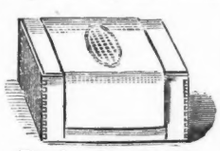


Fig. 6.—THE PACKAGE.

The Dollar a Pound Butter,

much of it comes to market in paper, that is, pasteboard, boxes, without covers, and wrapped in muslin. This is the plan followed at Echo Farm, and Mr. Starr's imitators. These boxes have the following, or an equivalent, printed upon them; "This butter must not be left in this box or napkin, but put in a cold place, but not in contact with ice, nor near any meat or vegetables." Long contact with the wet "napkin" is supposed to hurt the color of the butter, and to impair its flavor also. Close wrapping in the Wax Tissue has no such influence, but preserves the butter practically air-tight, and even though placed in the family "food safe," or ice-box, the flavor is not affected. The butter in these paper-boxes is placed in cases upon shelves, or in layers, separated by thin boards; in hot weather, space being left for a can of ice, and so shipped under lock and key.

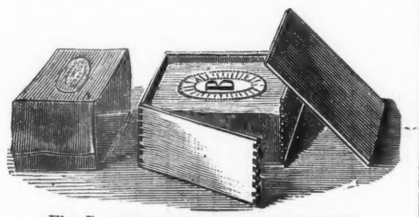


Fig. 7.—THE PACKAGE KNOCKED DOWN.

Tin Shipping Cases.

I have two other butter packages to describe at present. One of these is quite new—a stout hand-pail, holding perhaps 14 quarts, but adapted to the size of the round prints which it is to carry, is provided with large muffin rings, which will just take in a "pat" of butter, and are high enough to protect the device upon the print. Three or four of these are placed in a layer, and one layer is placed upon another, separated by a disc of tin, while the bottom layer rests upon a stout disc, strengthened by a ring, and having a stout wire coming up from it as high as the edge of the pail, where it is turned into a ring to lift out the whole contents at once. The top layer is covered by a disc of tin, which is held in place by the rim of the cover. Figure 8 shows this pail, which is well adapted to sending small quantities of butter short distances in summer, or any distance in cold weather. A heavy iron ring protects the bottom, and a lock and chain, such as are used upon milk cans, makes all secure. In warm weather it would be well to jacket the case, when the butter, if started cold, would not soften for nearly 12 hours. The

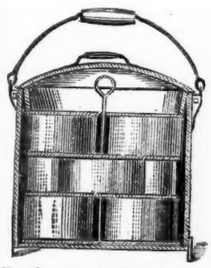


Fig.8.—TIN SHIPPING CASE.

"Norton Butter Shipping Case."

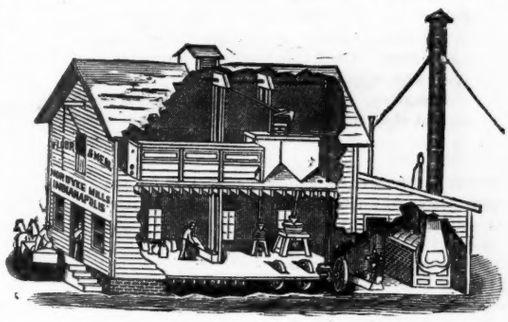
Circumstances lately recalled to my mind a shiping case for butter, which I saw in use many years ago, by the late Mr. John T. Norton, of Farmington, Conn., and which I learn is still used by the Farmington Creamery Co., under Mr. Edward Norton's management, and more or less by other parties. I give you a sketch from recollection (fig. 9). The case holds 50 lbs. in summer, and 60 lbs. in winter, but might be made smaller. The butter is held in pans, with perpendicular sides, having a narrow rim, turned in at the upper edge. Each pan holds ten pounds, in balls or prints, and one pan rests upon another. They are placed in a heavy tin cylinder, like the body of a rail-road milk can. At the top a pan for holding ice is placed, with its rim resting on the rim of the outer case, and this is covered by a double pail cover, with a handle, through which the chain is passed, by which the cover is locked down. The case has handles like a milk can, a heavy iron hoop at the bottom, and at the top, and is shipped jacketed in felt, covered with stout, colored muslin. The handles come through the jacket. The effect of the ice is distinctly perceived in the lowest pan, and the case is a very strong one, and not liable to damage, as handled by the "gentle" express and railroad hands.

Fig. 9.—THE NORTON CASE.

Railroads vs. Farm Stock.—The thousands of miles of railroads now in operation in the United States, and the many more to be built, makes the subject of the killing of farm stock, by passing trains, a practical and important one. Under the existing laws, railroad companies are required to either fence both sides of their roads, or to provide an equivalent barrier, and to maintain cattle-guards at all crossings; the corporations are only released from damages done to stock when all such fences and necessary measures are taken to keep stock from their tracks. If the track is thrown open at any point, not from public necessity, the company is liable for damages. The fact that the owner of the stock has not taken any pains to keep his cattle out of danger, does not relieve the railroad corporation of its obligations to provide barriers.

Grain Mills to Order.

One need not be very old to be able to remember when the erection of a mill, even the simplest, for merely grinding corn, was an important event. There was much calculation beforehand, as the work of many different persons was required, a great number of parts was to be provided from various sources, and all, finally, with much trouble, brought together, and adapted to one another. After much disappointment and many delays, the mill was started; yet the mill was worth all the trouble it cost. From the moment it was completed, the locality rose in importance, and became a center to the neighborhood for many miles around. It made every farm within a wide circle more valuable, for


NORDYKE & MARMON GRINDING MILL.

however successful the farmer in raising good crops of Indian corn and wheat, they must first go to the mill before they could be utilized. At first we had wind-mills and water-mills, and then mills independent of either wind or water, being worked by steam, but whatever the motive power, the making and bringing together of all the varied parts of the mill itself and its accessories remained a work requiring both forethought and time. It is not surprising in the general improvement in all agricultural machines that the mill, that most important accessory to the farm, should have kept pace. It used to be said, when parts of Maine were noted for their activity in ship-building, that ships were built by the mile, and cut off in lengths to suit purchasers. In a similar manner, one can now order a mill of a given capacity, and receive it, motive power, mill, and all complete, to the last nut and the wrench to turn it with, in a very short time. Rarely have we examined a catalogue with so much interest as we did that of the Nordyke & Marmon Co., of Indianapolis, Ind.; it is, in fact, a treatise rather than a catalogue, having 175 large pages, and so full of illustrations that a friend with strong mechanical tastes much desired to possess it for the beauty and variety of its engravings of machinery and parts of machines. As motive powers, various steam engines are described and figured, and the manner of utilizing water power, with directions for estimating the power of a stream, are given. Mills, from the largest to the smallest, are illustrated in full, with every accessory to their proper workings, including machines for cleaning the grain before grinding, to those for packing the finished flour, and in the minutest detail, showing every part, wheel, nut, screw, etc. But we can not enumerate the contents of this interesting work, suffice it to say that it shows every step, after the wheat leaves the threshing machine, and after the corn comes from the hands of the husker, needed to convert the one into flour and the other into meal. We were pleased to note that, while large establishments are provided for, the needs of small mills are not overlooked. One can procure a complete mill, with two run of stones, one for wheat and the other for corn, with every accessory, including motive power, ready to be set up in any one or two story building, as seen in the engraving, at a very moderate outlay. In

those wheat-growing localities, where the grain has to be sent a long distance to a mill, and the flour, for use, returned an equally long distance, a farmer, or several associated farmers, may easily establish such a mill, and it would no doubt be a profitable investment, and at the same time a convenience as well as a blessing to the neighborhood.

LOADING LOGS ON TO A WAGON.

Ventilating Stables.

In the construction of stables there should always be a provision for proper ventilation, and at the same time for preventing any draught from falling directly upon the animals. While there is a wind, ventilation is easy to secure, but when the air is still, it is different, and the air of the stable too often becomes foul. The valvular window is generally preferred to all others for the introduction of air, and a plain ventilating shaft for carrying away the bad air. This ventilator, seen closed in figure 1, is a combination window and ventilator, the movable part being a sash of glass guarded by bars of iron. It is shown open in figure 2, the sash being against the outstanding frame. The distance to which the sash is opened is regulated by a ratcheted rod, fig. 3, fixed near the upper end of the ventilator. The air, as it enters the stable, must rise and pass in the direction of the arrows. The size of the ventilator should be about two feet square, and situated above the heads of the horses.

The foul air is best carried off by a small wooden shaft; passing from the top of the ceiling of the stable, to the roof, where it is protected by down-draught guards; one foot square is large enough for a stable of six horses. A section of a stable, with the shaft *a*, and ventilator window, *b*, shown in position, is given in fig. 4. It will be observed that the fresh air enters above the horses, and the foul vapors pass away above also, thus preventing any chilling draughts that will surely come by having the air enter the bottom of the stable. There is a constant interchange of the upper and lower air.

Fig. 1.

Fig. 2.

Loading Logs.

A log is a heavy and difficult thing for one person to handle, unless he takes advantage of it. By *advantage* we mean, availing ourselves of any contrivance or mechanical power which enables us to avoid lifting it directly up by main force. In loading logs, the work may be greatly facilitated by using the inclined plane. In many places there is not sufficient snow for logging with sleds, and the wagon must be used. The engraving shows the method of loading logs upon a wagon by ox-power. Two strong skids, ten feet or so in length, are provided, one to be placed near each end of the wagon, as shown in the engraving. One hind wheel is then removed, the axle being blocked up; a chain is fastened to the body of the wagon near the middle, and passing under the log midway from its ends, is brought back over the wagon to the oxen or horses upon the opposite side. With this arrangement the log is brought upon the wagon with very little effort. The team must be steady—and for this work oxen are to be preferred to horses—else the log may be carried too far, and all the work be lost. It is usually best to drag the logs into heaps, and, if possible, where the wagon may be on lower ground than the logs to be loaded. In snow, the same method may be used with a sled, with even greater ease than with the wagon, as it is lower.

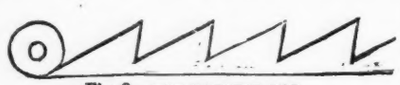


Fig. 3.—THE RATCHET ROD.

Tim Bunker on Town Bounties.

When I saw Seth Twiggs coming down Hookertown street with an uncommon cloud of smoke about his old beaver, I knew there was something in the wind. He hauled up at my wood pile, took a seat on a log, and said he:

"Did you ever see folks act so like a pack of fools as they did at town-meeting. Jest as we've got the foxes under a little, and pretty much scared 'em out of town, they must go and repeal the bounty. Why, I can remember arter the bounty was raised that we used to pay $500 in town bounties on foxes, showing that we killed at least a hundred foxes every season. It wan't of much use to try to raise poultry, especially near any piece of woodland, for the foxes in spring would come right up to the barn and snap up geese, turkeys, and hens, even in the day time. Deacon Smith, I know, lost twenty dollars' worth of turkeys in one night, and I 'spose two thousand dollars would not pay for the poultry killed and carried off by the foxes. With hunting with hounds in the winter, and digging out the young ones in their holes in the spring, they had become mighty skase and poultry stood a good chance."

"I can tell jest what was at the bottom of the repeal," said Jake Frink. "Ye see, George Washington Tucker and myself took a scoot up thro' the White Oaks last spring and holed an old she-fox and arter digging the better part of a day, we took her out and six of her young ones, and got thirty-five dollars at the town treasury, bounty money, a pretty good day's work. Ye see this riled Uncle Jotham Sparrowgrass, Benjamin Franklin Jones, and a few more of their set, who had opposed raising of the bounty from two to five dollars. They said it was making money too fast and robbing the treasury. So they kept Hookertown street in an uproar all summer and talked agin bounties, until they made most folks thing it was the unpardonable sin. So you see when town-meeting was warned, it was put in to repeal the bounty on foxes. There was a general turn out at the meeting, especially of people who never owned a turkey or chicken, and the bounty was taken off. I guess they'll get their pay 'fore long in the price of chickens and turkeys."

This talk occurred three years ago last spring, and Jake's prophecy has come true. The repeal of the bounty has led to the multiplication of foxes beyond measure, and hardly a farmer in town has escaped visitation this summer. Poultry yards have been decimated, and in a few cases cleaned out, so that no Thanksgiving turkey is left for the spit. It has borne much harder upon the farmers back near the woodlands than upon people living on the street. The fox is a crafty creature, and loves his own safety, a little better than fresh turkey and goose. A farm-house near a bit of woodland is his special delight. He can steal a young turkey at any time and be out of sight before his theft is known. In the absence of bounties, there has been no special inducement to hunt foxes, cur dogs have taken the place of hounds, and it is only as hunters have come in from the city that a fox has been killed. They have grown so bold that it is common to see them in the morning prowling around our barns. It is somewhat difficult to estimate the damage done by them, for they begin their depredations in the spring, killing geese and turkeys upon the nest, while sitting, or while yet with their broods, before the young ones are capable of taking care of themselves. Some farmers, who have sold three hundred dollars' worth of turkeys in a year, will not have half that amount this year. The tax upon the poultry yards is many times heavier than the bounty money would have been, and it is much more unevenly distributed. It is a mistaken policy to repeal the bounty upon foxes at any time. If it is kept on persistently, they will be hunted until they are driven from the borders of the town, and the bounty will be reduced to the minimum. Foxes are like weeds. None should be left to go to seed. They have fulfilled their mission, and no place should be left for them in a civilized State. They are unmitigated pests and too expensive to be tolerated. The policy of repealing bounties is pennywise and found foolish. If we try to save the bounties, the foxes will quadruple the amount by laying our poultry yards under toll. They will make poultry yards insecure and unprofitable The true policy would be to have the bounties offered by the State instead of the towns. Then the ex-

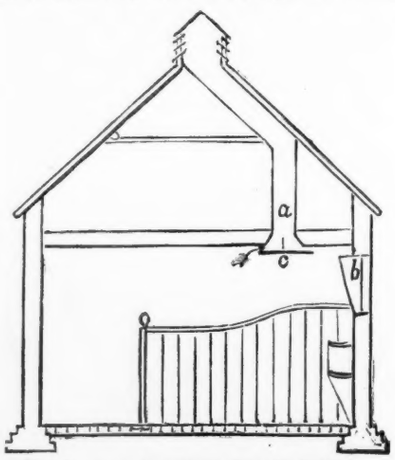


Fig. 4.—PLAN OF VENTILATOR OF STABLE.

termination would go on over a large territory at once, and if the policy were continuous, foxes would become as scarce as bears and wolves. There would be no unfairness in this mode of taxing, for the cities indirectly would be as much benefitted as the agricultural towns. Make poultry raising secure and its price is cheapened in all our cities.

Hookertown, Ct., Nov 5, 1879. Yours to command, TIMOTHY BUNKER, Esq.

Mines and Mining Terms.

The United States has the richest mineral deposits of any country in the world. The gold and

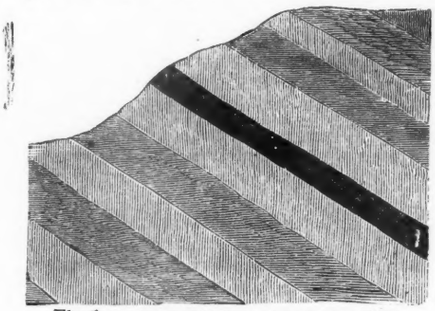


Fig. 1.—A BED BETWEEN STRATA OF ROCK.

silver mines are now yielding nearly 80 million dollars yearly, and the enormous deposits of silver ore and gold-bearing rocks discovered within the past two years, promise to double this yield whenever the new mines shall be opened and made productive. There were coined in the year ending June, 1879, over 65 million dollars of gold and silver, and these metals to the value of 12 millions were used in manufactures. The coal deposits are larger than those of any other country, each of several of the States having a larger area of coal than the whole of Europe, while the beds of the purest iron ore, and the veins of copper and copper ore, are equally superior in extent and value to any others in existence. The future development of our mining promises to surpass any thing previously known in the world. The recent wonderful discoveries of silver, and the rapid extension of mining, have created a general interest in mining, and the terms used by miners have passed into the periodical literature of the day. As every intelligent person, when reading of "levels," "slopes," "winzes," "bonanzas," and the like technical terms used in mining, wishes to know their meaning, we propose to give such a sketch of the general operation of a mine as will explain and illustrate them. Mineral deposits are found in the shape of beds or veins. A *bed* is a deposit lying conformable to and between the strata of rock in which it is found, as seen at figure 1, in which the dark, shaded part represents a bed. The immense deposits of silver bearing

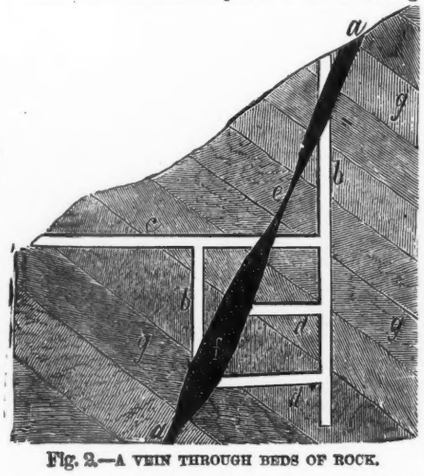


Fig. 2.—A VEIN THROUGH BEDS OF ROCK.

lead ore recently discovered in the neighborhood of Leadville, Colorado, are in beds, and such beds are not of the regular or permanent character of what are known as true fissure veins. Veins differ from beds in penetrating the rock across the strata, as seen at figure 2, in which the lines from *a* to *a* represent a *vein* cutting through the beds of rock, *g, g, g*. The point where the vein protrudes at the surface of the ground, is called the "out crop," and veins are most frequently discovered by finding its fragments, which are called "float," upon the sides of the mountain below the vein, or at the bottom. When these pieces of "float" are observed, the "prospector" searches above until he finds the vein from which they came. If the vein is a promising one, and is found to contain valuable mineral, a shaft is sunk to "prove" it. A "discovery shaft" is one sunk on the vein and following its direction for the purpose of proving its value. When this is found to be satisfactory, a working shaft is sunk perpendicularly through the rock in such a manner as to give the greatest facility in working the vein and raising the mineral to the surface. The shaft is shown at *b*, figure 2, and cuts the vein at some distance below the surface. A tunnel or "adit level," *c*, is driven horizontally through the rock to cut the vein as low down the mountain as possible, and through the vein to the main shaft to carry off water and ventilate it. From the adit level it is usual to sink other shafts, *b*, to reach the vein at a still lower level, and other "levels" are driven from the main shaft, as shown at *d, d*, to cut the vein in as many places as possible to make the working more effective and profitable. Veins are not regular in width or their direction; they "pinch" in places as at *e*, sometimes so closely that the "walls" are separated only by a mere thread of vein rock, while at other places the

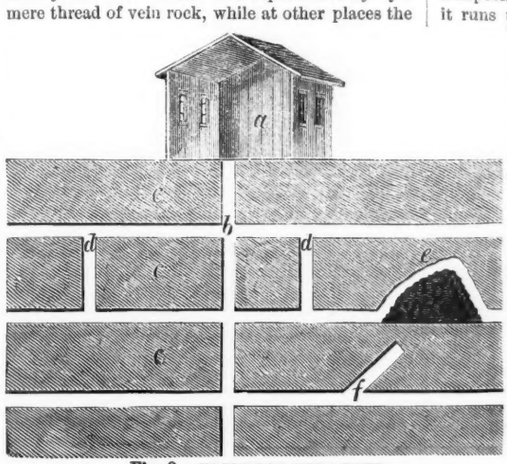


Fig. 3.—HOUSE FOR THE SHAFT.

walls separate widely, enclosing enormous masses of mineral. When the ore found in such a wide space is rich, it is known as a "bonanza," and many millions of dollars of gold and silver have been taken from single mines in such places. The lower wall of a vein is called the "foot wall," and the upper one the "hanging wall." The wall is the surface of rock which is in contact with the vein, and is often smoothed and polished by the movement of the vein matter upon it pressing with enormous force. The rock outside of the vein is called the "country rock," and that in the vein, and with which the mineral is mingled, is called the "vein matter" or "gangue." This is usually quartz in fissure veins. When the shafts have been sunk and levels driven, the vein is said to be "opened on," and the work so far is known as exploring. The vein is then worked for profit. A house is built over the shaft for protection (*a*, fig. 3), and is called the shaft-house. Hoisting machinery is set up, and pumps are put down the shaft to free it from water. The work on the vein differs from that on the shafts. Figure 3 is supposed to represent the workings on a vein as would be seen if one side was exposed to view; the shaft is seen at *b*, the lines, *c*, are levels or "drifts," and the opening of these on the vein is called "drifting"; levels are usually driven at each 100 feet down the shaft after "pay-rock" is struck. At *d* is a "winze," which is an opening made perpendicularly from one level to another. At *e* the process of "stoping" is shown; this consists in taking down the vein matter from overhead; the rich mineral being taken out and the waste being thrown down and left to fill up the level. At *f* is an "upraise," which is the reverse of a "winze," and is used to follow up

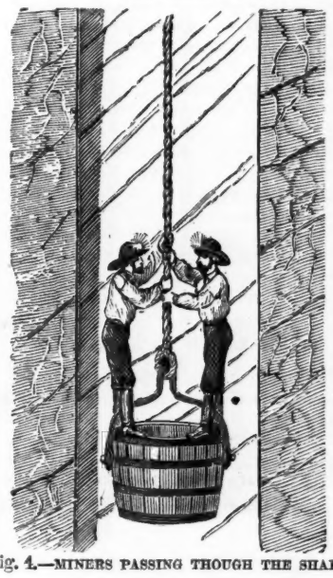


Fig. 4.—MINERS PASSING THOUGH THE SHAFT.

a deposit of ore richer than usual, and which, when it runs up into the vein, is called a "chimney." Such a deposit recently found in a California mine carried the market value of the stock from $6 up to $90 per share. The stoping on the vein goes on until all the valuable mineral is taken out, when the levels, as they are worked out, are abandoned. When the rock passed through, in a level, is loose and liable to fall, the level is timbered, as shown at figure 5. Very strong timbers are put together, as there shown, a few feet apart, and others are laid from one of these to the other when required to support the roof. An enormous quantity of timber is used in a large mine, and in some cases the timbering has taken fire from the lanterns or from blasts, and has burned out, doing much damage. It is in this way that mines take fire; and coal mines are sometimes thus fired, and the coal itself burns for months or years. At figure 4 are shown two miners descending a shaft on a tub, which is used to raise the rock and ore to the surface.

The Useful and Beautiful in Poultry.—If we are to accept the statement of Darwin—and no one is more careful and reserved in his expres-

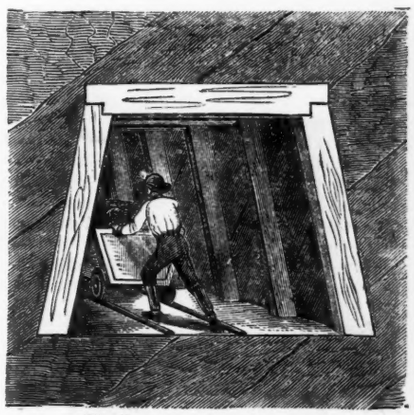


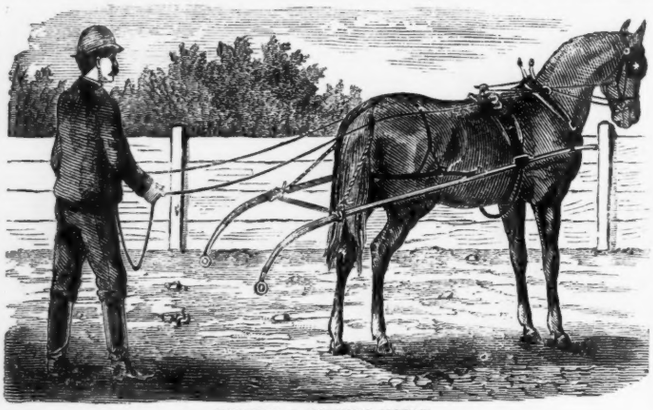
Fig. 5.—THE LEVEL TIMBERED.

sions than he—no domesticated animal admits of so much variation, beauty of shape, and richness in coloring, as poultry. But we are not called upon to accept this solely from the multitude of facts presented by this great naturalist in his work, "*Variation in Animals and Plants, Under Domestication.*"

If one visits one or more of the many Poultry Exhibitions, now being held in widely separated parts of the Union, he will be convinced of its truth. There are breeds upon breeds, and varieties almost without number, some of them being quite new to the trade. To the making of new varieties of poultry, there seems to be no end; but with it all, the stock, as a whole, is getting better. Division of labor has come in, and some breeds are noted for their sitting powers, while others, so to speak, furnish the eggs, while others still, furnish the best flesh. It is pleasant to think that outward beauty, and inward usefulness, can be thoroughly combined in these birds; to know that in some cases, "fine feathers," *do* make "fine birds," and that a graceful form, and proud bearing, does not of necessity exclude solid and useful qualities.

Training of a Kicking Horse.

A method of curing a kicking horse, or of training a colt to withstand any unusual pressure or contact of the harness behind, is described as follows: The animal is harnessed, as usual, to the shafts of a buggy or wagon; the shafts are then separated from the vehicle, being kept from trailing on the ground by straps or cords from the crupper,



DRIVING A KICKING HORSE.

as shown in the engraving. The horse or colt is then driven in the usual manner, the driver walking behind, and occasionally pushing the shafts to cause the breeching to press on the hind-quarters, or pulling them sidewise to interfere with the crupper, or in any way that may be possible, endeavoring to disturb the animal and train him to remain quiet under the disturbance. The horse may kick as he pleases, the shafts can not be hurt, as they are raised at every attempt. In time the horse will understand the matter, and refrain from kicking.

The Sheep's Foot—Care and Neglect of It.

Foot-rot is a most destructive disease of the sheep. There is an incipient, and easily preventible, and curable form of this disease, and there is a malignant and contagious Foot-rot, which infects and poisons the soil, and spreads sometimes with most frightful effect, among large flocks, destroying the sheep by hundreds and thousands. The malignant form grows out of the other, and it is questionable if it could not be prevented from spreading among the sheep, even from infected ground, if their feet were only in good condition. But the sheep's foot is seldom in good condition naturally, because the

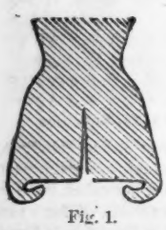


Fig. 1.

Fig. 2.

shepherd rarely thinks it necessary to examine it, until something wrong is evident, from the lameness caused by it. Then precaution comes too late. The manner of growth of the sheep's foot is peculiar, and upon this depends its proclivity to damage and disease. The walls of the hoof grow from above downwards, meeting the growth of the sole at the junction; the outer layers of the former being produced indefinitely, and if not worn away by contact with the ground, pass the sole and spread beyond it, turning under, and forming a loose covering, beneath which, moisture, filth, sand, stones, and other foreign matter find a lodgement. These foreign matters soften the horn of the sole, or otherwise injure it, so that disorganization, or distruction occurs, and carries the injury into the interior of the foot. Stones or gravel that may be enclosed under the excess of horn, press upon the softened sole and irritate the sensitive tissues under it, and although as yet, no actual damage may have occurred, yet the sheep is unable to walk upon its feet, and moves about on its knees. When this is seen, no time should be lost in examining the flock, and remedying the mischief, while this can yet be easily done. The feet will probably appear as shown at figure 2, the walls of the foot having out-grown the sole, and not only turning under at the sides, but turning up at the toes (figs. 2 and 3), thus preventing the natural use of the feet. This is to be remedied by the use of a pair of toe nippers, made expressly for trimming the feet, and also by the use of the knife. The walls of the feet are trimmed at the sides with a knife, and all superfluous horn is removed. The toes are clipped with the nippers, figure 4; a pair of common pincers may be used, if the edges of the claws are filed and ground sharp. The hoofs then appear as at figure 5; the toes being clipped, to reduce the sole from the distorted form, to the rounded form, as shown at figure 3. Neglect of these precautions, has ruined many flocks, while the pastures have become so poisoned with the diseased and infectious matter, that no healthy sheep could be kept upon them, until after an interval sufficient to rid them of the contagion. The result of neglect may be described as follows: The horn of the sole being softened and decomposed, as previously mentioned, and the sensitive inner portions of the foot being injured, inflammatory and suppurative action is caused within the foot;

Fig. 3.

Fig. 4.—SHEEP'S TOE NIPPERS.

escape of the products of inflammation being impossible through the sole at first; intense suffering results, and a generally disturbed condition of the animal ensues. This is the first stage of malignant foot-rot. In course of time the sole is decomposed, and fetid pus escapes, by which the herbage and soil are infected. The disease spreads through the whole foot, and appears at the coronet. Fungoid, or mushroom-like excrescences appear on the sole, and at the coronet, and if neglected at this stage, the whole foot may be lost and the sheep ruined. In this condition, radical treatment is needed. The sound animals should be removed at once to new and clean pastures, or into a clean yard. The diseased sheep are to be treated, by means of caustic dressings of the feet; Hydrochloric (Muriatic) Acid, diluted with three times its bulk of water; a solution of one dram of Chloride of Zinc, in a pint of water, or Carbolic Acid should be used to destroy the diseased growths, and persevered in, until sound parts are reached, when the usual stimulant dressings may be substituted. The sheep

Fig. 5.

Fig. 6.

should be kept on a clean floor, covered, or well dusted with fine air-slacked lime, or in a dry, clean, soft pasture, which should be plowed, so soon as its use by the sheep is no longer necessary.

The Boys at Work.

Interesting Experiments in Corn Raising by 138 Maine Boys.—An Example Worthy of Wide Imitation.

Stillman B. Allen, Esq., for many years past in successful business in Boston, retains a lively interest in the place where he spent his boyhood, a quarter of a century or more ago—York County, Me. One of the ways of manifesting this interest is in stimulating the boys of the present day to observation, thought, and experiment. Last spring he offered $200 in seven prizes—one of $100, one of $50, and five of $10 each—to the boys in the County under 17 years of age, who should produce the most Indian corn upon one-eighth of an acre. Each boy intending to compete was to send his name before May 1st, to the President of the County Agricultural Society, who had charge of awarding the prizes. About 200 boys reported. A committee of one or more men was appointed in each town to measure every parcel of ground, and to be present at the harvesting, husking, and weighing of the crop, and report at the Town House in Alfred on Oct. 25. Each boy was required to fill out the blanks furnished, giving a full account of the time of plowing, planting, kind of seed corn, and full particulars as to manure, cultivation, etc, (These blanks will be bound in book form by Mr. Allen, and kept in the archives of the County Agricultural Society for reference and use.) We have before us the report of Mr. John Hall, President of the Society, giving a full account of the results obtained by 138 of the boys, some 75 of whom were present with their parents and many others, at the time of making the reports. We regret not to have been among the number to have seen the displays of the specimens of corn, and especially to have seen the bright-eyed, enterprising boys. We have space for but an epitome of some of the results. The ears were reckoned at 70 lbs. for a shelled bushel of 56 lbs.

The average yield of the whole 138 trials was just about 100 bushels of shelled corn per acre. The first prize was awarded to Moses Milliken, of Biddeford, for 160 bushels per acre. 2d to David J. Morrell, of Cornish, 153 bushels. The next five prizes went to A. O. Bennett, of Waterboro, 145 bushels; Cyrus H. Smith, of Dayton, 144 bushels; Willie B. Moore, of Limerick, 142 bushels; Charlie G. Austin, of Lebanon, 141 bushels; and Arthur M. Deering, of Waterboro, 140 bushels. Six boys raised 131 to 137 bushels per acre; 12 raised 120 to 127 bushels; 23 produced 110 to 119 bushels; 24 produced 100 to 109 bushels—making 72 boys who grew 100 bushels and upward. 22 others produced from 90 to 99 bushels per acre. 29 obtained 75 to 89 bushels, and only 15 fell below 75 bushels of shelled corn per acre. Doubtless, owing to poor soil, lack of fertilizers, etc, many of the boys getting the lesser crops were entitled to high praise for their efforts. Indeed *we* commend every boy who had the intelligence and spirit to enter the contest.

This shows what can be done in producing corn in a county in Maine, lying between 43° and 44° of

north latitude. Not having the reports before us, we can not judge as to the profit of such crops, the cost of manure, cultivation, etc., nor are we concerned as to this in the present case. The important result is the effect upon the boys themselves, and upon many other boys in the county and elsewhere. These boys were led to *think, reason, observe.* They will each examine into how and why this and that one succeeded better or poorer than themselves. They will be better thinkers and workers hereafter. Mr. Allen's thoughtful offer will be worth to his native county, in the far reaching future results, more than tens of thousands of dollars expended in some ways that might have been selected. We heartily wish there might be a Stillman Allen for every county in the whole country; and where there is not, we suggest that a

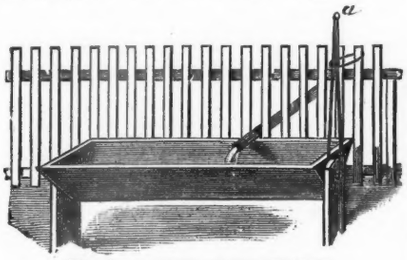


Fig. 1.—WINTER WATER TROUGH.

like sum—if necessary one of the $200 prizes often given to some fast "nag"—be appropriated by the Society to the benefit of some hundreds of youth. The boys of "17 and under" of to-day, are to be the actors upon the stage a very few years hence.

P.S.—Mr. Allen is so pleased with the result in York County that he now offers prizes of $200, $50, and five prizes of $10 to the boys of the entire State, who shall produce the most corn from one-eighth acre during 1880. Those not over 18 years, who desire to compete, will send their name and address to Hon. B. F. Hamilton, President Maine State Agricultural Society, at Biddeford, Me.

Hints and Helps For Farmers.

A WATER TROUGH FOR WINTER.—An ice-clad water trough for cows to drink from is neither pleasant to them nor profitable for their owner. To raise 20 or 30 quarts of water from freezing point to nearly 100 degrees, will use up the effect of a large quantity of food, which should be made to do more useful work. In such cases the waste of food and loss of vital force, and consequently of fat, flesh, or milk, is very large, and is one of the largest leaks of the farm. Water coming from a well or spring at a temperature of 50° to 55°, and drank at this temperature will not chill an animal, but refresh and invigorate it. But if the water is not freshly drawn, and the trough is covered with ice, it chills the animals thoroughly, and they will not drink as much as they need. A water trough that may be kept free from ice and snow is shown in the engraving.

Fig. 3. Fig. 2.

It is suspended on pins at the ends, fitted in posts as shown in figure 1. When not in use, it may be turned over and kept free from snow, and as the trough is empty, no ice can form in it. For the purpose of turning it over easily a handle, *a*, is fixed to one end, and when not in use is fastened to the fence by a wire loop or a hook, thus easily preventing the trough from being inverted by accident.

A BAG HOLDER that may be made and applied in

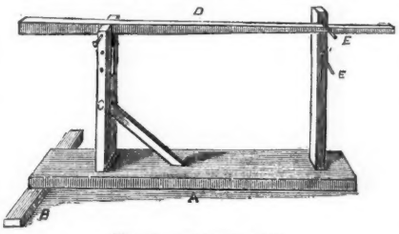


Fig. 4.—WAGON JACK.

a few minutes is shown at figures 2 and 3. Figure 2 represents two pieces of wood joined, and suspended by a cord or light rope, as made plain by the engraving. At figure 3 is a bag held open by the holder and suspended by the cord. By the use of this simple contrivance, one person can, without help, fill a bag in the easiest manner.

WAGON JACKS.—Clarence Hollins, Todd Co., Ky., sends a sketch and description of still another Jack, which is shown in figure 4. The piece, *A*, is made of oak or other strong wood, and should be five feet long, six inches wide, and two inches in thickness. The cross-bar, *B*, is to keep the jack upright. The portion *C*, is 26 in. high; *E*, *E*, are pins to keep the lever, *D*, down. This Jack is easily understood. The engraving tells the whole story.

WAGON JACK NO. 2 comes from S. P. Harrington,

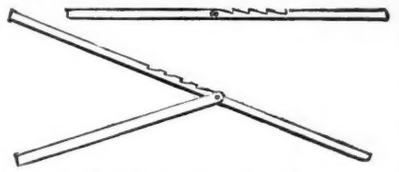


Fig. 5.—WAGON JACK NO. 2.

Marion Co., Ind., who has used it for 12 years, and finds it in every way satisfactory. Its construction is simple: Take a piece of hard-wood 1¼ in. thick and 2¼ in. wide, 5 feet long; another piece of the same size 2 ft. 8 in. long is fastened to the long one, near its middle, by a bolt. In using the Jack take hold of the long piece, and putting it under the axle at one of the notches, raise the wheel, when the short piece follows it up and holds it in place. When the wheel is to be lowered, the lever is raised a little, the short piece is pushed back with the foot, and the work is done. The jack appears to be handy, and is certainly easily made and cheap.

Barn-door Fastenings.

A number of years ago, the writer had a colt that was uncommonly crafty, and soon became an expert in opening barn and stable doors. The door to the horse-stable, was fastened by a sliding wooden bar (fig. 1), moved by an out-standing pin; this door was easily opened by the colt, until a hickory spring was put on the bolt, which kept it firmly in place. A contrivance like this, makes the fastening a self-acting one, when the door is swung closed. The door to the adjoining barn, opened by a latch string, (fig. 2), and this the rogue found, and could grasp with his teeth, and pull down, when the door would open. For a time we pushed the strap through the hole, but this, though it kept the colt out, made it difficult for us to open it. We soon thought of putting a strip of board—a sort of awning—over the strap, as shown in figure 3, and this proved effectual in preventing the colt's proceedings. Any further efforts of his were unavailing. The old hand-hole and hook fastening, is one that is very safe, and quite convenient. As shown in figure 4, it consists of an iron hook, attached near the inner edge of the door, and is hooked to the casing by the hand, which passes through the hole, when hooked from the out-side. There may be an objection to this method of fastening, because it leaves an opening for wind to pass in. This may be remedied by tacking a piece of leather over the hand-hole, leaving the bottom unfastened.

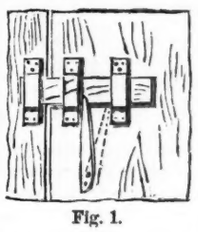


Fig. 1.

Fodder Plants—"Teosinte."

At no former period has there been so much interest felt by our farmers in plants producing green fodder, as during the past two or three years. This interest is wide spread, and extends not only north and south, but, as our correspondence shows, from Nova Scotia to Washington Territory. This is a gratifying feature in the present condition of our agriculture, as it shows a disposition to get out of old ruts, and to ascertain if there is really anything better than we now have, and also indicates that soiling, regarded by the best dairymen as the best practice, is receiving a more extended trial than heretofore. Among the present green-fodder plants, Indian Corn stands at the head. But fodder-corn covers only a part of the season, and yields but one cutting, while there is a desire for earlier plants, and those which will bear repeated cuttings, and give a succession of succulent food, thus getting a much larger return from the same area of ground. Besides, there are some who do not think that fodder-corn is the best food for furnishing the best butter; not so much that it imparts an unpleasant flavor to the butter, as that it fails to give the butter that peculiar aroma that comes from the best pasturage. But those who have tried Indian Corn as a green fodder, find it to possess so many advantages, that they are not likely to abandon it, until something decidedly better is brought to their knowledge, and they have tested its value. Is there anything that is, on the whole, better?—We are not prepared to answer this question; but with a view of reaching an answer, we have, in the past two or three years, brought to notice, figured and described, the various new plants—or new to use—as they have come to our knowledge, giving such statements in regard to them as were to be procured. We have had the various kinds of Durra, Guinea-grass, Prickly Comfrey, Pearl Millet, and others, each one of which has shown its value in some localities. That we shall find another plant that will be so generally and widely valuable as Indian Corn is not to be expected. Nor is it to be expected that a plant that will give five or six cuttings in the season in the Cotton States, will be equally productive in Maine. Still, take the trials that have been made, the country through, they have been on the whole useful, and the more so, perhaps, the farther south they

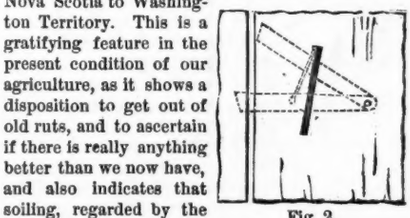


Fig. 2.

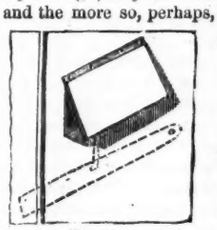


Fig. 3.

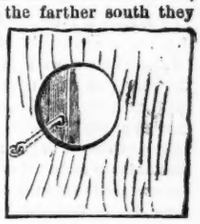


Fig. 4.

have been made. Among the various new plants is one we have not yet noticed, "Teosinte"; though the seeds of it were offered last spring by Mr. Carson, there was but little to be learned about it. The seeds have been sent from the Royal Gardens, at Kew, England, to various British Colonies, including the Bahamas and the West Indies generally, Cyprus, South and Tropical Africa, and Australia. The reports from most of these localities, and others, have been favorable, almost to extravagance. Sir Joseph Hooker, the Curator of Kew, kindly sent us a packet of the seeds, and a trial showed us that while the plant can hardly be of great value in northern localities, it is evidently of wonderful promise for the Southern States. The recently re-

ceived Report of Kew Gardens has figures of the plant, which came to perfection at Kew, under glass.

The luxuriance of the plant, even with us, is something remarkable. A single seed produced 12 or more stalks, very leafy, and of a dark green, and a rankness of growth, indicating that it would like to have a hot and long season, just to show what it could do if it had a chance. Our plants were but

Fig. 1.—"TEOSINTE" (*Euchlæana luxurians.*)

five or six feet high, while it reaches, when fully developed, 12 feet or more. The plant was first introduced as *Reana luxurians*, but according to Hooker, its proper name is *Euchlæana luxurians;* its specific name is descriptive, as it would be difficult to find a plant of a more luxuriant appearance. To the botanist the *Euchlæana* is of great interest; it is a near relative of Maize, producing, like that, its staminate flowers in a "tassel" at the top of the plant, as shown in figure 1, taken from the plant at Kew. It also, like corn, has its pistillate flowers at the nodes—or joints below, inclosed in a leafy involucre, or "husk." But there the close resemblance ends. In the corn, the pistillate flowers and seeds are in many rows upon a short branch (or cob), in this they are closely placed in rows upon slender branches or spikes, one of which is shown at the upper left hand, in figure 2; which gives the appearance of the "ear," within which is inclosed a number of such small spikes. We can only say that the reports made to Kew from several hot countries to which seeds had been sent, are such as to warrant a thorough trial of the "Teosinte" in our Southern States. Dr. Sanders, in Madras, put in the seeds at five feet apart; soon the plants so spread that they all touched, the produce of some single seeds being 100 to 120 stalks, and suggests that it would be a valuable fodder for elephants! The report from Australia states that it withstands the severest drouths. Being a perennial, it will allow of repeated cuttings, and we judge that, the amount of fodder that an acre of "Teosinte" will produce in a favorite climate is something enormous. Caution.—Observe that what we have said applies to the plant in tropical and subtropical climates, and we doubt that it will be valuable north of Virginia, if even so far north as that.

Cut-Leaved Trees—Paper-Mulberry.

Among the variations from the usual form, of which our ornamental trees and shrubs are capable, none are more popular than those called "Cut-leaved," and sometimes "Fern-leaved." On most trees and shrubs, the leaves consist, as may be easily seen, of a frame-work of fibres, the spaces between which are filled up with a, usually, dark green pulpy matter. This soft substance is the part removed in making "skeleton leaves." The fibres of leaves, when large, are called "ribs," and these, in most leaves, are arranged on two principal plans. A main rib starts from the base of the leaf, where that joins the foot-stalk or petiole, or if there be no petiole, where it joins the stem, and runs directly through, to the point, dividing the leaf into two, more or less, equal parts. From this, which is called the "mid-rib," start smaller fibres, or veins, and run more or less directly towards the margin. In other leaves there is no mid-rib, but there are three, five, or more strong ribs, starting from the base to the circumference. The first class of leaves are called *pinnately-veined* (like a feather), and the other *palmately*, (like the hand with out-spread fingers), or *radiately-veined*. In the first case, the leaf is usually longer than broad, while in the radiately-veined-leaf, its shape will be more or less rounded in form, like the leaf of the Maple. In some leaves, the margin is entire, but as is well-known, they present every variety of division, from a mere notching of the margin, to those where the divisions extend far into the substance of the leaf. Examples of trees, which have leaves much divided in their ordinary condition are not rare, but these are not included under the term "cut-leaved," that term is applied to departures from the normal form. The ordinary Sumach has its long leaves, divided into many (11 to 30) leaflets, but we do not call this "cut-leaved," as it is its natural form, but when the leaflets themselves become divided, it is then the "Cut-leaved," or "Fern-leaved" Sumach, and one of the most beautiful shrubs in existence. These unusual forms of leaves are due, so to speak, to a deficiency of their green or pulpy portion: there is not sufficient to fill up the spaces between the frame-work, and what there is, clings to the ribs or veins, leaving open spaces between. Hence the "cutting" will follow the direction of the fibrous framework of the leaf, and the much "cut," pinnately-veined leaf, will produce a very different form from the radiate-veined one. It is in the detecting and propagating such unusual forms as cut-leaved trees and shrubs, that the horticulturist finds one of his chief pleasures. So far as we know, there is no method by which these interesting, and often elegant forms, may be produced at will. They are usually manifested by the young seedling—"Congenital deformity" we should call it in an animal, and kill the young creature at its birth; but in the plant, we cherish and propagate it. Some trees when they first start from the seed, or when they push up a vigorous shoot from a stump, after the tree has been cut down, produce leaves, unlike those of the mature growth. The *Paulownia*, *Catalpa*, and others, produce on young shoots, leaves of enormous size. The common Paper-Mulberry, (*Broussonetia papyrifera*), under such conditions, has not only unusually large leaves, but those singularly and often grotesquely lobed and cut; but these peculiarities disappear after the stem is a year or so old, and may be regarded as a condition of infancy. But a variety of this tree has been raised in France, from seed, by M. Billard, which is, to judge from the figures published in *Revue Horticole*, one of the most striking of all cut-leaved trees. In the engraving here reproduced from the above named journal, are shown two of the leaves, which it will be seen are little more than skeletons. In the normal form, the leaf is somewhat heart-shaped, with three strong radiate veins from the base. In this variety, all the pulpy portion is gone, save a very small quantity at the ends of each of the three veins. Evidently there was not material enough to carry out the plan of the leaf. This variety is named var. *Billardi*, and has not, so for as we are aware, yet been offered for sale by the nurserymen of this country

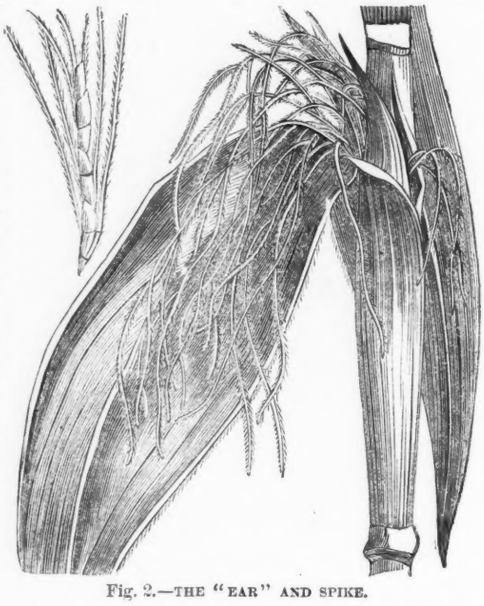
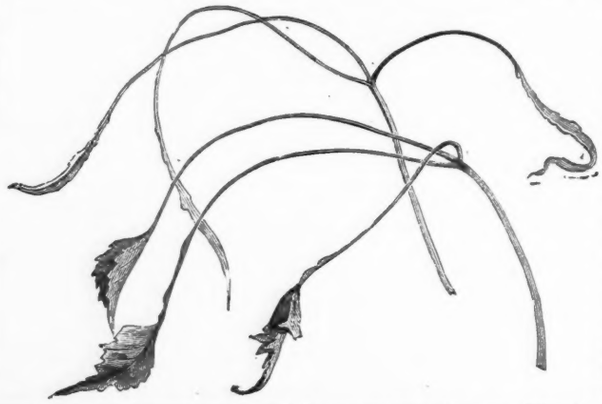


Fig. 2.—THE "EAR" AND SPIKE.



THE CUT-LEAVED PAPER-MULBERRY (*Broussonetia papyrifera*, var. *Billardi*).

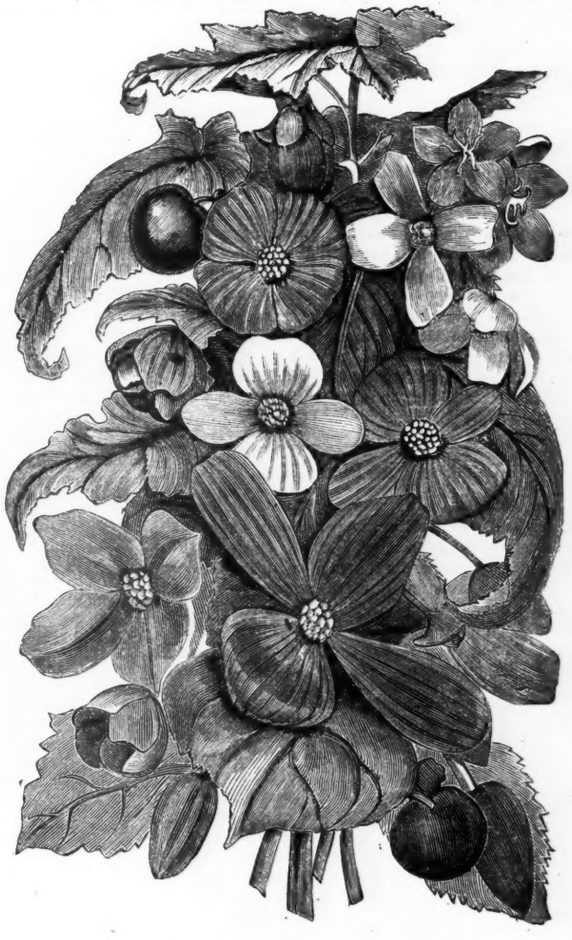
The Two-Colored Bush-Clover.

The great value of hardy late blooming plants in our climate has rarely been so strikingly manifested as it was last autumn. Two or three sharp frosts took away the very tender things, after which the hardy late bloomers had it all their own way for some weeks. The Two-colored Bush-Clover which has been for some years a favorite with us, showed how well it deserved our partiality by holding out to the very last, and bloomed until checked by exhaustion rather than stopped by the cold. The title given above is a translation of its botanical name *Lespedeza bicolor*. The genus *Lespedeza*, so named in honor of Lespedez, one of the Spanish governors of Florida, is one of the large Pea Family (*Leguminosæ*); its neat three-parted leaves and very small flowers (though not in close heads) are enough like those of clover to warrant the common name of Bush-Clover. There are several species found in most parts of this country, but as none are very showy they rarely attract the attention of any but botanists. The species in question, *L. bicolor*, comes from the region of the Amoor river in Northern Asia. It forms a much branching half shrubby plant from three to five feet high; its branches being long and slender, droop at their extremities, giving the mass a most graceful appearance; the stems and foliage are of a very pale green, being covered, at least when young, with light silky hairs. The flowers, shown of the real size in the engraving, are in sufficient numbers to compensate for their small size, as they quite clothe the branches. In color they are of a delicate tint of rose, which may be described as violet rose. The general effect of the plant, the modest flowers combined with, rather than contrasted with, the subdued color of the leaves, is most pleasing. Not the least of its good qualities is its long endurance; beginning in August, it remains in flower until the time of killing frosts, and is a capital addition to our late-blooming plants. This Lespedeza is given in the European journals and horticultural works as a shrub; it is shrub-like in habit, but not in duration. The stems, though quite strong and woody, die down nearly or quite to the ground at the end of the season, new ones appearing the next spring, and growing rapidly. It is really a herbaceous perennial rather than a shrub, and as would be inferred from its far northern origin, is perfectly hardy. It is not particular about soil, and is easily multiplied by cuttings. We received this plant as *Desmodium penduliflorum*, and there seems to be much confusion between the two, *Desmodium* and *Lespedeza*, in European collections.

THE TWO-COLORED BUSH-CLOVER (*Lespedeza bicolor*).

The Tuberous-Rooted Begonias.

While planting in bedding designs, or as the French call it, "Mosaic planting," with Coleuses and other plants with colored foliage has been successfully done in this country, the attempts to produce similar effects with flowers have rarely been satisfactory. This general failure is due to following English examples. Excellent designs, with the plants to be used in carrying them out, have been given in the English journals, but an attempt to reproduce these with the same materials, in this country, have been mostly miserable failures. The difference in the climate of the two countries will account for this. Plants that in the moist climate of England will bloom all summer, with us have a very short flowering season and are done with. For garden decoration of this kind, the working out of designs with flowers, we must find a very different set of plants from those used abroad. While our hot summers make most of the plants used for this work in England, unavailable with us, we, on the other hand, can employ those which the English gardener would not think of putting in the open ground. Among the plants with brilliant flowers, especially suited to our summers, are the Tuberous-Rooted Begonias, especially the hybrids. The genus *Begonia* is a very large one, and its numerous species, natives mostly of South America and tropical Asia, present such a diversity, that there are several distinct groups. One section, of which *Begonia Rex* is an example, has very short stems and insignificant flowers, but most beautiful leaves, and are solely cultivated for the ornamental character of their foliage. Another set, represented by the beautiful *B. hybrida multiflora*, are profuse bloomers and are among the most popular winter flowering plants. Not many years ago there were introduced several species different from others in habit, in producing a large tuber at the base of the stem; these, their flowering season being over, stopped growth, dying down to the tuber, which, after a season of rest, was started anew. *B. Boliviensis*, *B. Vietchi*, and *B. Frocheli*, and others, are South American species of this group. Soon after the Tuberous-Rooted species came into cultivation, it was found that they hybridized with the greatest ease, and that the resulting hybrids often excelled the original species in the size and brilliant coloring of their flowers; they are now among the most popular plants abroad, and are rapidly coming into favor as they are better known in this country. The plants have generally a good habit, grow from one to two feet high, and produce the greatest profusion of flowers, differing widely in size and shape, and presenting a wide range of colors, which are clear and well defined, and often remarkably brilliant. The engraving, made up of a collection from a number of these new hybrids, shows all that a wood-cut can give, the shape and relative size of the flowers, and whether they are dark or light; the brilliancy in some, and the delicate tinting in others, we can not give; they are given here at about half their real size, and are of every shade from pure white through the most delicate rose and pink to the deepest shades of crimson and scarlet.



TUBEROUS-ROOTED BEGONIAS.

and on the other hand from the most delicate cream and sulphur colors up to the deepest orange. In many the leaves are very elegant, not only in form, but they are often handsomely veined and tinted. The catalogues of the European dealers offer about a hundred named varieties, and though the lists of our florists are not so full, they offer a good selection at moderate prices. Not the least of the merits of the Tuberous Begonias is the ease with which they are raised, and if one can get seeds of a good strain, plants quite as fine as the named varieties may be produced. A pot of good, rich, light soil should be prepared; the very fine seeds are to be sprinkled over the surface, and merely pressed down into the soil; cover the top of the pot with a pane of glass, and keep in a temperature of 50° to 60°. When the plants are large enough to handle, pot them off into similar soil. Started in February, and well cared for, the plants will be large enough to turn into the open ground and flower the same summer. They may be kept in pots to bloom in the greenhouse, for the decorating of which in summer they are especially valuable. They are essentially summer-bloomers, and when their bloom diminishes the water should be gradually withheld, the tops allowed to die down, and the tubers allowed to ripen; these may be kept in the earth, or taken out and preserved in a warm place until spring, when they are to be potted and started into new growth.

What is the Black Knot?

The conspicuous excrescence often found upon Plum, and wild, and cultivated Cherry trees, and well named the *Black Knot*, is an old enemy to the fruit-grower. From its destructive nature it early received the attention of scientific men, and much has been written and said upon this subject, in fact, much more than was really known. Some have claimed that the knot was caused by insect stings, a form of gall, in nature like those on the oak, willow, etc. The fact that the knots—especially the old ones—frequently contain insects and their eggs, remains, etc., was accepted as evidence that such was the case. Though many investigators have found a fungus present in the knot; it having been first described by Schweinitz, in 1838, yet, until the recent, and thorough investigations made by Professor Farlow of Harvard University, all doubt of fungus origin was not cleared away. The following are his reasons for believing that the knot is not caused by insects: "First the knots do not resemble the galls made by any known insects. Secondly, although insects, or remains of insects are generally found in old knots, in most cases, no insects at all are found in them when young. Thirdly, the insects that have been found by entomologists in the knots, are not all of one species, but of several different species, which are also found on trees that are never affected by the knot. On the other hand, we never have the Black Knot, without the *Sphæria morbosa*, [The scientific name of the fungus. ED.].. and the mycelium of that fungus, is found in the slightly swollen stem, long before anything that

Fig. 1.—MATURE STATE.

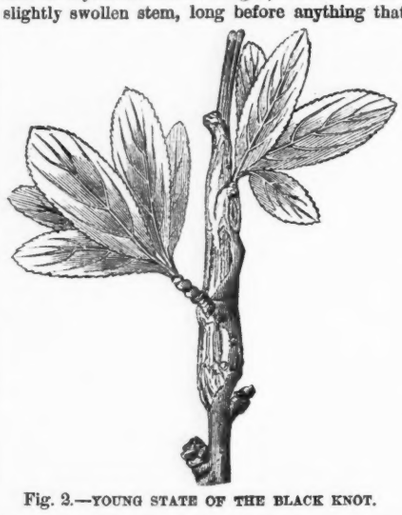


Fig. 2.—YOUNG STATE OF THE BLACK KNOT.

could be called a knot, has made its appearance on the branch; and furthermore, is not known to occur anywhere except in connection with the knots."

The Black Knot is most conspicuous in the winter season, when the trees are not covered with foliage, and they range in size, from half an

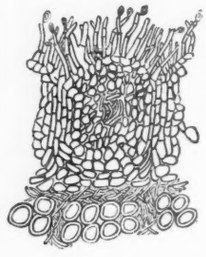


Fig. 3.

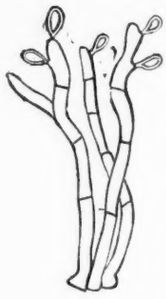


Fig. 4.

inch, to a foot or so in length. The knot does not usually surround the branch on all sides, but growing from one side, often causes the branch to bend away from that side, or twist into an irregular shape. A knot, much reduced in size, is shown in figure 1, with its surface undulating, and more or less cracked. When the knot is a large one, it usually kills the branch, or continues to spread up and down from the old knot, until death comes to the branch. Figure 2 shows the Knot in its early stages. In the spring the affected part increases rapidly in size—one might almost say puffs out—and the whole, growing larger, becomes thick and is soft; rupture of the bark soon follows, and the soft substance, coming to the surface, expands rapidly, and is soon coated with a characteristic greenish color. All this time the threads of the fungus have been increasing rapidly; in fact, the swollen substance is made up largely of these threads, and as they develop and become exposed by the rupture of the bark, multitudes of spores form on the interior filaments. Fgure 3 shows a thin section or slice through the young knot, with the exterior threads of the

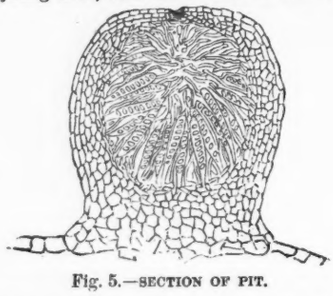


Fig. 5.—SECTION OF PIT.

fungus, producing small spores, *a*, *a*. The same is seen more highly magnified in figure 4. This takes place about the time the cherry and plum trees are in flower. These spores continue to be formed, until midsummer, when a new development begins, which is for the production of the winter spores. As autumn approaches, the black color develops, the outer surface hardens, and frequently the interior soft substance is destroyed by insects, and only a shell remains. In this crust, are small nodules, or protuberances, one of which is shown in figure 5. These nodules are pits, on the inside of which a multitude of small sacs are attached. Figure 6 shows two of these sacs, in each of which are eight spores, the universal number in this species of fungus. These spores are not fully developed, until very late in the season. The Choke Cherry (*Prunus Virginiana*) is a favorite home for the Black Knot, as the neglected fence rows in winter show. Next to the choke cherry, in the severity of its attacks, are the cultivated varieties of cherries and plums. "The Morello Cherry is more susceptible than any other variety, and next in order comes the Mazzard." Some varieties are free from the knot.

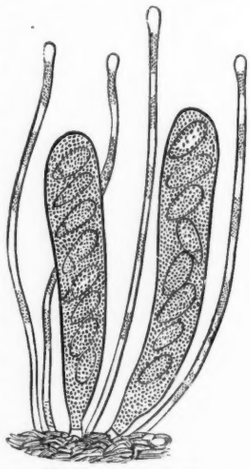
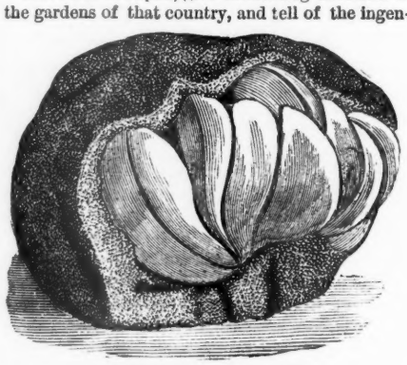


Fig. 6.—SPORE SACS.

REMEDY.—Like all troubles caused by fungi, the Black Knot is contagious, and is propagated by the millions of spores it produces, one crop of which is developed through the spring and summer, and the other in the late autumn. The knife is *the* remedy. Cut off the knots, wherever, and whenever found, and burn them. This can best be done in autumn, after the leaves have fallen, and the knots are exposed to view. The Choke Cherry bushes and trees, might better be cleared away entirely, if situated near pear or cherry orchards.

How the Japanese Pack Bulbs.

Travellers in Japan, give interesting accounts of the gardens of that country, and tell of the ingenious appliances, such as shades made of bamboo strips, and greenhouses covered with paper, so prepared as to serve as a substitute for glass. The specimens that come to us, show that they are well advanced in the art of horticulture. We saw the first of the beautiful Japanese Maples that came to this country, and these, as well as other plants, showed, that in grafting, they had little to learn from us. We were recently at the opening of a case of lily bulbs, just imported, and these were packed in a manner that showed not only great care, but a knowledge of the requirements of the bulbs. The bulbs in question were remarkably fine ones, of the golden-banded lily, *Lilium auratum*. Upon opening the case, only large flattened balls of dried mud were to be seen. Each bulb was enveloped by a covering of what appeared to be dried



JAPANESE LILY-BULB CASE.

swamp muck. The bulbs had each been thoroughly covered when the earth was moist and plastic; this was worked around the bulb by the hand, to fill all the interstices among the scales, then well formed and smoothed, and afterwards dried. When this covering was removed, the perfect condition of the bulb showed that the Japanese well understood what was required for their safe transportation. The engraving shows the appearance of the bulb, with a portion of its covering removed.

Woodchucks in the Garden.

The woodchuck, (*Arctomys Monax*), is one of the most troublesome pests of the farm and garden. Though exceedingly shy, he not infrequently prepares his burrow in some corner of the garden. His favorite food, in the meadow, is clover, and the amount of this food a community of woodchucks will destroy, is enormous. In the garden, his favorite food is lettuce, cabbage, and beans. His presence is generally indicated in the early spring, by the mysterious dissapearance of the leaves of young cabbage, just transplanted, so that the gardener is in doubt for a time, whether the woodchuck, or the worms have been foraging. A little watching at noon, or just at evening, from a safe distance, generally reveals the intruder with head erect, on the lookout for his enemies. There is no safety for anything in the garden, while this pest is abroad. The mouth of his burrow is usually in a bank, or side-hill, or stone-wall, has many apartments, and several openings, so that it is almost impossible to drown him, or smoke him out. It is not easy to trap him, and his ear is so quick to catch the slightest sound, that it is difficult to get near enough to shoot him. Having suffered much from these visitors in years past, we determined, this season, to try a new remedy. Noticing that the young cabbage disappeared regularly every day, we transplanted a large cabbage, with leaves six or eight inches long, in his favorite feeding ground. The leaves were dusted over with Paris Green. The second day after the transplanting, the most of the heads disappeared. The third day, we found near the mouth of the burrow, a large female woodchuck dead. We continued the experiment for a few days about the mouths of the burrow, and the depredations entirely ceased. This is altogether the cheapest, and surest method of destroying the pests, that we have ever tried. Paris Green is in almost universal use for destroying potato bugs, and every farmer can avail himself of this remedy, with very little trouble. Of course the same precautions are to be used in poisoning woodchucks, as potato bugs. A dime expended in Paris Green, will save many dollars worth of vegetables. CONNECTICUT.

The Plant Individual.

When we look at one of the higher animals, it is evident that we see an individual—a single *unit* of the kind—a whole not capable of living in a divided state. We get our idea of an individual from such forms of life because here it is the most distinct and therefore evident. As we descend in the scale of animal life, the evidence of individuality diminishes, until we come to forms where it is entirely swallowed up, and only communities or congregations of individuals are seen. For example, in the coral we find a number of units joined together through life. Among plants the individual is still more difficult to observe, and is a point upon which there has been considerable discussion. Some have held, that all which comes from a single seed is an individual. This would make some units very large indeed. All plants not propagated by seed, as the various varieties of apples, pears, potatoes, etc., etc., according to this view, would consist of single individuals. All Baldwin apple-trees would belong to the same individual. This limit for the plant unit is too broad, and will not answer. Another, and the generally accepted, view is that a plant individual consists of the smallest part which in general will live and grow when separated from its former place and given fitting conditions for growth by itself. The gardener, in making a cutting of a geranium or verbena, for example, takes a portion of the stem containing a bud—it may be very small—and places it in the sand. A man in grafting, fastens a similar portion of one kind of plant in another. Such a portion is now considered the plant individual. In this light a tree or shrub is not a plant unit, but rather a single plant community in which the individuals are united in a common work, and in great measure dependent on each other, because a division of labor is maintained.

We speak of a maple tree as an individual, but it is so only, as a swarm of bees is a unit of life; in fact, we can find considerable similarity between the tree and the hive. The bulk of the plant is made up of the ordinary foliar units, which have no sexual organs developed, and are for the elaboration, formation, gathering so to speak, of the nourishment of the whole community—the plant hive—they are the *workers*, and *neuters*. Other individuals are devoted to the work of producing new colonies, namely, the stamens in the flowers, which perish as soon as their work of fertilizing the pistils is accomplished; these are the *drones*. The *queen* of the plant hive is the pistil, in which seeds develop, and when mature, are ready to separate from the parent, and form a new and independent plant colony. A large growing tree is a vast and constantly increasing community of plant units, each consisting of a bud and a portion of the stem which bears it.

Impeachment of the Robin.

The robin (*Turdus migratorius*) is the favorite bird of the Northern States, coming early in the spring, and leaving only with the killing frosts of autumn. He is not infrequently seen in wid-winter, in mild seasons, amid the boughs of red cedar, or other evergreens in sheltered places. We hardly know the secret of his popularity; for he is not more beautiful than many other birds, has no sweeter song, is no more useful, but the greatest pest. We are sorry to disturb the confidence of cultivators in this favorite bird, but after the observation of several years, we are obliged to put him down among the pests of the garden. Last spring a flock of robins settled in the vicinity of my garden. Their first depredations were upon the strawberry bed, where they gorged themselves with luscious Monarch of the West, and picked and marred more than they ate, until I invested in an old fish seine, which covered the bed. As the green peas swelled in the pod and became large enough for a side dish with roast lamb, they tore open the pods, and scooped the contents. I admired their taste, but was vexed at the daily thefts. When the cherries turned red they perched in the tree tops and sung their songs as gaily as if they never looked at the cherries below. They devoured pecks of them and never said a word about the theft. When the currants ripened the robins seemed to invite all their neighbors to the feast, probably because I had fought currant worms for three years, and had a good crop, while my neighbor's bushes had been killed by these insects. The birds took the better half of my crop. I thought there might be some rest after the small fruits were gone. But when the Beurre Giffard pears ripened in early August, the robins punctured every red cheek, selecting the handsomest fruit, with the eye of an epicure. They followed the pears steadily for three months, living upon the fat of the land, and only spared the winter pears because they were too hard for their taste. They visited the grape trellises as soon as the fruit was ripe and followed them until frost came. What have I in return for this wholesale depredation? Absolutely nothing which I cannot get cheaper elsewhere. Insects destroyed, you suggest? Not much. They did not clean my currant bushes of worms. Hellebore did that. They did not clean my apple, cherry and elm trees of canker worms. Tar did that, effectually. Well, they sung, you say. Yes, but I have better and cheaper music in the house. I see no good reason why this pest should be spared and cultivated. So next season when it is inquired: Who killed Cock Robin? the answer will not be "I, said the Sparrow, with my bow and arrow," but "I, Connecticut's son, with my two-barreled shot-gun."

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Holder for Wisp Broom.

A design for making a handy and useful article is here given. It is a holder for the wisp, or short-handled broom-corn clothes brush, so generally in use. The holder is cut from Bristol board; it may be all in one piece, and folded in the middle, or of two similar pieces, each forming a side, with their edges fastened together with ribbons or any other way that fancy may suggest. It is then hung

Fig. 1.—HANGING WISP BROOM-HOLDER.

for use by two or four strings. In figure 1 is shown the appearance, as regards general shape, etc., when complete. It will be seen that the holder is open at the top and bottom, and that the brush is put in at the top, handle down, and when desired it is drawn out through the bottom. The side may be ornamented as one may fancy. We saw some at a recent fair, with the injunction, "Brush your clothes," wrought in letters and curves upon the side. But this is rather superfluous, and suggests that the person addressed is not neat in his habits. We see no reason why the holder could not be fastened to the wall by one side, and thus do away with the strings. A case for carrying the broom when travelling is shown in the second engraving. Those who are puzzled what little present they can make for a friend, who is going away, have here a

Fig. 2.—TRAVELLING BROOM-HOLDER.

very simple thing, easily made, and which will be in daily use. It is merely two pieces of pasteboard of the same size, fastened together by pasting strips of cloth over their long edges. It is then to be papered neatly, and trimmed as one fancies. It may be ornamented by cutting initials from paper of another color and pasting them on, or these may be put on with water-colors. The size will be ac-

cording to that of the brush, which should be so compressed as to occupy about half its former width. If preferred, the covering may be of embroidery or crochet-work, as the ornamentation may be carried out in considerable variety.

Cleaning Chimneys.

Foul chimneys are at this season a source of great danger; soot is very inflammable, a mere spark will set it on fire. No one knows the condition of his chimneys, what cracks there may be in the brickwork, nor what timbers there may be near those openings through which fire may penetrate. Hence, it is an indispensable caution for every householder to see that the chimneys are swept down, or up, at this season. A chimney may be swept from the bottom by means of a brush made on the end of an elastic pole or rattan cane, as shown at figure 1. The brush may be made of a number of goose or turkey-quills, or splints of hickory or ash, or even small twigs of trees, fastened tightly between two round pieces of thin board or sheet-iron. This brush is fixed to the end of a long, slender, limber pole, or rattan, and is thrust up the chimney from the fireplace. A very light brush and pole only are needed, as the least touch is sufficient to bring down all the soot and dust that may be adhering to the sides of the flue or resting on the slopes of it. When the chimney has been swept for the length of one pole, a second one is spliced to the first, and this is repeated until the whole of the flue is cleaned. To prevent the entrance of the dust into the room, any more than can be avoided, a cloth of some kind should be fastened over the fireplace to confine it in the chimney. The sheet may be held upon the mantelpiece by placing sad-irons upon it, and the workman—a small boy is the best for this purpose—may be covered by the sheet, having the nose and mouth protected by a wetted handkerchief tied over them. This method, however, should only be used when it is not possible to get at the chimney from the top of the house. When this can be done, the work is much less disagreeable. It will be found best in this case to get the brush to the bottom before sweeping, and then work upwards,

Fig. 1.

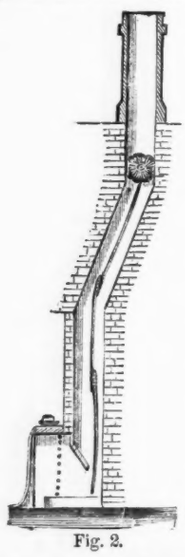
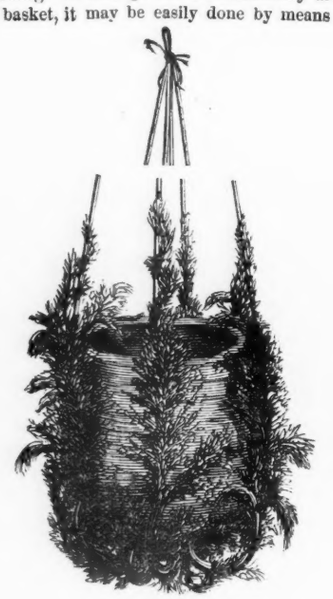


Fig. 2.

lest by beginning to sweep from the top the dust and soot may choke the flue part way down, and thereby cause much trouble to clear the obstruction.

The Carrot-Basket.

A very pretty hanging-basket can be made from four or five inches of the top, or crown part, of a large carrot. The inner portion of this upper end of the carrot is to be removed with a knife, leaving a shell about half an inch thick. Three or four cords are fastened to the rim, and the basket is ready to hang up at a window. The cavity of the basket is to be kept filled with water, and care taken that it does not become dry. After a while the carrot will start into growth, and as the delicate, finely divided leaves appear, they will turn upward on all sides, and soon cover the little basket, with here and there the orange-color of the carrot showing through with good effect. Should the leaves need "training" to arrange them satisfactorily around the basket, it may be easily done by means of a



A CARROT-BASKET.

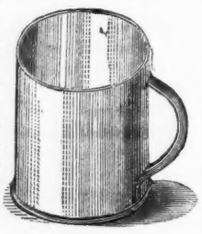
thread passed around them, or a bent pin stuck into the carrot, may be used to hold a leaf in place.

Household Notes and Queries.

PLACE FOR FLOUR.—Flour, like milk, though not so much so, is affected by bad odors of any kind, which it readily absorbs. Hence it should never be kept where vegetables, onions, etc., or fish, and such odorous things are stored. Flour should always be kept in a sweet, dry, cool, and airy room.

PAPER AND STRAW UNDER CARPETS.—In putting down the carpet for the winter, do not forget that a layer of paper should be first spread over the whole floor. Thick, coarse, and porous paper is made for the purpose; it is in a continuous sheet, and may be had at the carpet stores by the yard at a low price. Another material is made of two sheets of brown paper with a thin layer of cotton batting between them. In the absence of these, newspapers will answer about as well, and be much less expensive. Several layers of newspaper may be put down, or a single thickness of papers, over which is placed a thin layer of straw and other papers over this, putting in a tack here and there to keep all in place while putting down the carpet. Either of these will cover all holes and keep out the cold air, while the straw will give a soft surface to walk upon and greatly help to save the carpet.

A USE FOR FRUIT CANS.—Take round fruit, or vegetable, cans and melt off the top; bend a hickory withe for a handle, as shown in the engraving, and fasten it with wire or rivets. This makes a useful dipper, pitcher, measure, or vessel for many purposes about the barn or house; one may be made for the flour barrel; another for the sugar barrel or box; others for feed boxes, grain boxes, and for use in feeding poultry. In short, some 20 or more can be made useful on every farm or in every house, and as many dangerous nuisances, when these are lying about, will be got rid of profitably.



THE CAN CUP.

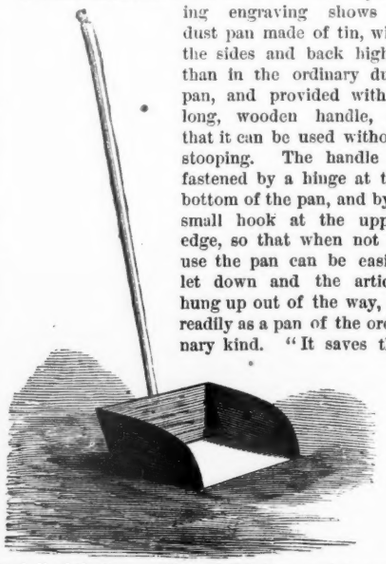
THE PUTTING TOGETHER.—A Michigan lady, Mrs. C. P. F., some of whose recipes have been sent to us, very properly says: There is so much in the putting together the ingredients that I hesitate to send recipes—so much depends upon one's own experience. There are very few who can handle a mere recipe. It makes a great difference just when you add the butter, the sugar, and the flour, and how the mixture is worked. It is no mystery to me that there are so few good cooks. To a very few the right method comes by intuition, but to the most, only by many sad failures, and a life-long watching. I think I am just as anxious about the bread now as I was 15 years ago, and there are some things I cannot see the reason for even now.

ORANGE CAKE.—Miss J. Van I. sends the following: 5 Eggs, 3 cups Sugar, 1 cup Butter, 1 cup Milk, 1 quart Flour, 3 teaspoonfuls Baking Powder. Bake in round tins like thin Washington Cake. Take the grated rind and juice of 2 Oranges, the whites of 3 Eggs, and Sugar to taste—usually less than one cup. Mix well, and spread between each two surfaces of cake, and it will flavor the whole.

WHITE MOUNTAIN CAKE.—Butter, ½ lb.; Sugar, 1 lb.; Flour, 1 lb.; Milk, 1 cup; Yolk of 6 Eggs; Whites of 3 Eggs; Soda, half teaspoonful; Cream of Tartar, 1 teaspoonful. Put the soda into the milk, and cream of tartar into the flour. Put in a little milk, and then a little flour, and so on. Add the whites of the eggs the last thing. Flavor with Lemon. Bake in thin layers, every layer iced, and the top covered with icing. Make the frosting with the white of three eggs and ¾ pound of sugar. Eight layers will be sufficient for ordinary cake.

TEA CAKES.—"Miss A. R.," Grand View, Iowa, recommends the following as very nice. Two cups sour Milk, half a pint each of Shorts and Rye Flour, three Eggs, well beaten, one teaspoon each of Soda and Salt, Butter the size of a hen's egg, mix and bake in gem-pans, those of iron being the best.

A LONG HANDLED DUST PAN.—The accompanying engraving shows a dust pan made of tin, with the sides and back higher than in the ordinary dust pan, and provided with a long, wooden handle, so that it can be used without stooping. The handle is fastened by a hinge at the bottom of the pan, and by a small hook at the upper edge, so that when not in use the pan can be easily let down and the article hung up out of the way, as readily as a pan of the ordinary kind. "It saves the



back" of the housewife, and this is enough to commend the dust pan to general use.

SPLITTING PAPER.—In selecting articles for a scrap-book, it sometimes occurs that one wishes to save the matter that is on both sides of the clipping. This may be done by splitting the paper. Place the paper under a piece of glass, so that it will be smooth, after which it is thoroughly soaked with water, when, with a little care, the upper surface of the paper can be entirely removed. The process is as much a matter of curiosity as utility.

VENTILATION OF ROOMS.—In winter it is one thing to keep dwelling rooms warm, and another to have them well supplied with pure air. There is nothing so abundant in the world as good, wholesome air, and nothing which we so seldom find in sufficient quantity in living rooms. We are apt to forget that air once breathed is not fit to breathe again, and only throw up the window or open the door when the air gets so bad as to cause a feeling of oppression. The air of a room should *never* get noticeably impure. Some rooms are "by nature"

provided with ample ventilation, and through the cracks the pure air finds abundant access, but most apartments, if not looked to, will limit the supply of oxygen and supply its place with the heavy noxious carbonic acid gas, which is the great source of dull head aches and sluggishness of mind and body.

In winter every sleeping room had better be a little cool than not be abundantly supplied with pure air. One should see to this on going to bed, and so adjust the window sash that there will be a proper supply of good air all through the night.

A HANDY TOASTER.—"W. W. B.," Unionville, Md., sends sketches of a Bread Toaster which he considers the best he has used. It is made of stout wire; the part to hold the bread is bent as shown in figure 1. The ends *a*, *b*, being turned to form rings into which the hooks in the handle (fig. 2) fit. The bread is put between

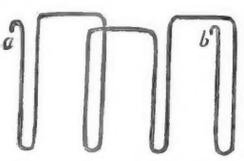


Fig. 1.—THE BREAD FRAME.

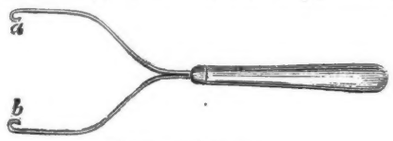


Fig. 2.—THE HANDLE.

the wires and is easily reversed by turning the handle over half way by an easy twist of the wrist.

Carrier for Large Jars or Cans.

Large jars, cans, or kegs, are unwieldy to handle when filled, and it is difficult to pour anything out of them. The French people use a very convenient carrier for the purpose of holding and tilting such vessels. This consists of a bottom board, to which are fixed two sides partly rounded and braced, as shown in the engravings. (See figs. 1 and 2.) Side pieces having a number of holes are fixed to the upright posts of the sides. These are for the purpose of arranging a strap or band to confine and secure the jar at a proper hight. The jar, can, or keg, is placed on the bottom board and fastened. When it is to be tilted to pour out the contents, it is simply rolled over, as shown at figure 2, and may be drained to the last drop. Kegs may be provided with spigots, having the orifice at the end, to be closed with a peg; the keg may then be easily emptied through the spigot without spilling a drop.

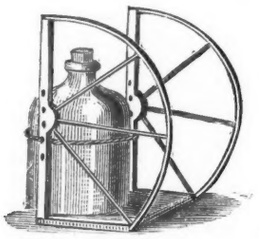


Fig. 1.—THE JAR UPRIGHT.

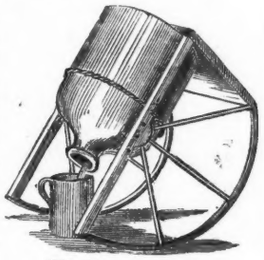


Fig. 2.—JAR TILTED.

Family Wastes.

It is often said, that the wastes of the household would fertilize a half-acre garden, if they were properly saved, and applied. The statement is undoubtedly true, but the if is the most important factor in the proposition. As a matter of fact, most families in the country, and villages, pay the least possible attention to these matters. The sink drain usually pours its contents upon the surface of the ground, within a few feet of the dwelling, and not infrequently, close by the well. A square rod or two of garden soil, is fattened, and kept soggy with water, and bad odors prevail through the summer. If a pear-tree, or grape-vine, happens to be planted within reach of this liquid manure, the abundant, and perfect fruit, show the value of the riches, that are wasted at this point. There is no burial of offensive matters, no utilizing thereof for the feeding of the soil, and the sustenance of the household. All these gross violations of the conditions of health, and of good husbandry as well, are justly complained of by our Boards of Health. If their Reports could be circulated among those who are most needy of their counsels, it might remedy the evil. Their teachings should be circulated in the journals that reach these families, and secure the needed reform. As a rule, any provision for the disposition of fecal matters, that does not absorb all odors every day, is defective. The most common provision, without a vault for absorbents, is a nuisance that ought to be abated, by civil enactments, with severe penalties.

The earth-closet system is effectual, if faithfully carried out. It needs, however, more executive ability than is ordinarily found in the head of the family, even if he be a cultivator of the soil. The best arrangement, on the whole, that we have observed, is a vault large enough to contain all these wastes for six months of the year, made of stone, or brick, and lined with hydraulic cement. This effectually prevents all escape of poisonous matters into the well; a matter that the head of the household can afford to secure at any cost. By the occasional use of absorbents, all the fertilizing material that falls into the vault is preserved. Offensive odors, if they arise, may be corrected by the use of Copperas. With such a vault, the gardener has a constant fountain of liquid manure, which may be applied to his growing crops through the season. The luxuriant growth of vegetables, the splendid berries, the purple clusters of the vine, and the ruddy cheeks of the pears, grown under frequent applications of liquid manure, will compensate any man for the trouble and expense of this vault.

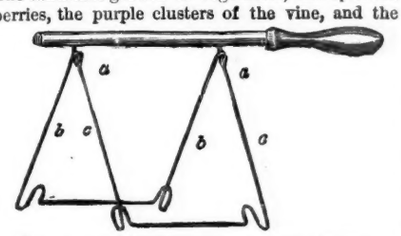


Fig. 1.—THE CONSTRUCTION OF THE LIFTER.

A Pie Lifter.

Mr. R. N. WARING, Blair Co., Pa., sends sketches and description of a pie lifter. "It consists of a wooden handle about 15 inches long, to which are suspended two rectangular claws 5x6 inches, of ¼ in. steel (or iron) wire. One of these claws is immovable, and is looped near its point of attachment to the handle (*a*, *a*); these loops admit the ends of the claw, as shown in figure 1. In using the lifter, the 'clips' *b*, *b*, of the immovable claw are brought under and against one side of the plate or article to be lifted, then by a twist and a light downward and forward motion of the handle, the clips *c*, *c*, of the movable claw, are brought in position on the other side. The second figure shows the lifter in place for carrying a pie. If properly made it will grasp articles within the reach of its claws, with firmness. I do not think it is patented.

Fig. 2.—THE LIFTER AT WORK.

BOYS & GIRLS' COLUMNS.

The Doctor's Talks.

At the beginning of a new year I would say a word to the new boys and girls:—by "new," I mean those—and there is often a large number, who come into our wide family for the first time. For some months past I have been trying to talk to the youngsters about some things which are seldom taught in ordinary schools, but which every boy, and girl too, should learn while young, else they will be obliged to learn them here and there, and sometimes by experience later in life. I do not think that I have given any distinct name to the subject of these talks. If I should call it "Natural Philosophy," or "Physics," either would prevent many of you from reading them, and they would be too high-sounding for these familliar talks on common things—there, that's it! "Common Things," is the very title I want. These talks on Common Things, then, began by my trying to answer a question about the Centre of Gravity; this made it necessary to talk about Gravity. As Gravity is exercised by all matter, the late talks have been about Matter, and its properties. Matter, as has been explained, does not mean any particular substance or thing, but applies to every thing that our senses can tell us about, everything that occupies space. The principal properties of matter, that is *hardness*, *brittleness*, *elasticity*, and others, have been described, and now we have come to talk

ABOUT MATTER IN MOTION.

If asked what *Motion* is, I think you will not find it difficult to answer—"a change of place." But nothing starts into motion or changes place of itself. You hold a marble in your fingers and drop it, the marble starts into motion and falls to the floor; in this case the motion is caused by the attraction of the earth, or gravity, which has already been described. The marble will remain where it fell for any length of time, but by pushing it with your fingers, you may send it rolling across the floor. You may move in a wagon with rapid motion, and still more rapidly in the railroad cars. A bullet shot from a gun moves still more rapidly.

ALL MOTION IS PRODUCED BY FORCE.

And we may describe a force as whatever causes a body to move, or if moving makes it stop. The marble falls by the force of gravity; it goes along the floor by the force of your fingers; the wagon goes along by the force of the horse; the railroad train moves by the force of steam in the locomotive, and the bullet is put in very rapid motion by the force of the powder burnt in the rifle. You will see from these examples that there are various forms of force, but we will not talk about these now, but consider the force as the same, no matter how it is produced. The marble upon the floor will not start into motion of itself. This inability of bodies to start into motion

IS CALLED INERTIA.

Inertia is a Latin word, and means inactivity. When told that inertia describes the fact that a body can not of itself start into motion, you can understand that, but when told that it also expresses the fact that a body in motion can not stop of itself; you will perhaps stop and think about if it can be so. Yet it is the fact that a body in motion can no more stop of itself than it can start of itself. It requires a force to start it, and when once in motion it requires an equal force to stop it. The marble in motion on the floor or the bullet from the rifle having no power to stop themselves would go on forever, were they not stopped by other forces. The marble is stopped in part by the resistance the roughness of the floor offers, and in part by the resistance offered by the air; so the bullet is in part stopped by the resistance of the air, and in part by gravity, for when the bullet is flying with almost lightning speed, gravity is acting upon it and it is all the while falling just as certainly as if it had been merely dropped from the muzzle of the rifle. Those who fire

Fig. 1.

Fans revolving in a vacuum.

AT A LONG RANGE TARGET

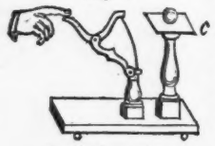
have to take both these influences into account, and to overcome the tendency of gravity to bring the bullet to the ground, must aim far above the target in order to hit it. The resistance of the air to bodies in motion is shown by the arrangement in fig. 1. In this there are two fly-wheels made of thin brass, *a* being placed with the vanes edgewise, and *b* with them flat-wise to the air; *d* is a contrivance for setting them in motion with the same force applied to both. The whole is covered by a large bell of glass. When set in motion, which is done by

pushing down the knob at the top, both will start off alike, but soon *b* will "slow up" and soon stop, while *a* is going on almost as lively as ever. The whole is then placed upon an air-pump, and the air is pumped out of the glass. The wheels are then started, and both will continue to go alike, and one will not stop before the other. But you can easily test the resistance the air makes to moving bodies without such an apparatus, by taking a piece of pasteboard, or even this number of the paper, and move it first edgewise, and then flat-wise against the air. That a body in motion requires a force to stop it may be shown in a striking manner by trying to stop a grindstone that you have set to turning rapidly, by taking hold of the handle.

FOR ILLUSTRATING INERTIA

there is an old fashioned piece of apparatus, shown in fig. 2. Upon a little pillar at the right hand is placed a card, *c*, and upon this is set a marble. There is a contrivance seen at the other side by which a spring is bent by a lever, when that is pressed down by the finger, the spring is suddenly let go, hits the card, which flies out from under the marble, leaving that in its place. You can, with a little practice, show the same thing without this arrangement. Place a smooth card, and on this a coin, like an old fashioned cent, or a silver quarter dollar. Then hit the end of the card a smart fillip by snapping the thumb and finger of the other hand in a manner to give the edge of the card a sudden blow, when the card will fly out, leaving the coin upon the top of the finger. It can be easily learned with a little practice. If the card were slowly pushed, instead of struck a sharp blow, the motion would be communicated to the coin, and both would go off together. Inertia, or

Fig. 2.



Inertia Apparatus.

UNWILLINGNESS OF BODIES TO MOVE,

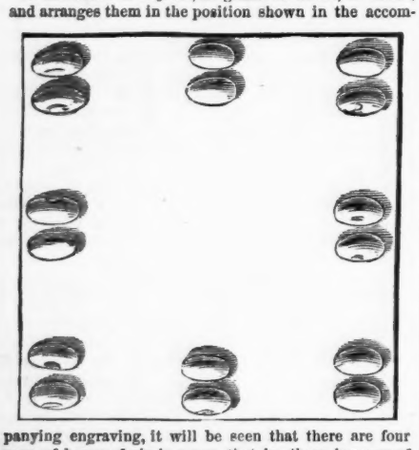
is sometimes unpleasantly illustrated in our own bodies. If we are seated in a wagon and the horse starts with a sudden jump, we go with a thump against the back of the seat, or if the seat has no back we fall over backwards completely. In the same manner if the horse is going rapidly and makes a sudden stop, we are thrown forward. The injuries in some railroad collisions are due to the inertia of moving bodies. The car coming in collision with other cars, stops very suddenly; the passengers being in motion, go forward with great velocity, and being thrown against one another, and against the seats and sides of the cars, causing frightful injuries. If you quite fill a cup or glass with water and move it suddenly, or if carrying a cup or glass and are suddenly stopped, the liquid in either case will be spilled. If a boy throws a stone and hits a window, the pane will be shattered—as many a boy knows to his sorrow, but if a rifle ball hits the glass, generally, only a small hole is made, the inertia of the surrounding glass holding it in place, the ball passing so rapidly that motion is not communicated to the rest of the glass. We will not go beyond this—which is in some books called

THE FIRST LAW OF MOTION,

which is "The inability of a body, whether when at rest, or in motion, to change its state." There is more to say about motion, and in the next talk on the subject I can give you more illustrations on this, one of the Common Things. The two here given are from Mr. John J. Thomas' excellent work on "Farm Implements and Machinery."

A Little Puzzling.

If one takes 16 objects, as grains of wheat, or beans, and arranges them in the position shown in the accompanying engraving, it will be seen that there are four rows of beans of six in a row, that is—there is a row of six on each side. This may be made clear by simply covering up all but one side or row. Four more beans, or whatever may be used for the puzzle, are now to be put into these four rows of six in a row, so that there will be no more rows, and no more in each row. If it is thought necessary to move the objects already arranged, the liberty is granted, but remember that the 20 beans are to be put in four rows of six in a row. Remember that.



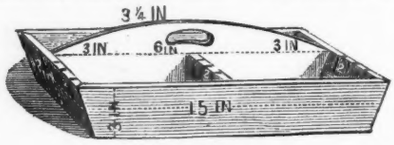
Can a Thing Move and Remain Still?

This question was proposed in May last, as those who have last year's volume can see by turning to page 193. It was there shown that a figure, which was printed upon the page, could be made to appear to be in rapid motion, while you were all the while sure that it did not move at all. This is only one of many cases in which we do not

see things as they really are, or as it is commonly called "an optical illusion." If we try we can cheat our own eyes and those of others very readily; the illustration given in May last shows one method, and we have, in former years, given several others. In May there was a single figure of circles within one another. Prof. J. P. Thompson, of Bristol, Eng., has improved upon that in the manner shown by the engraving here given. You have only to lay the paper upon the table, or hold it flat before you, and move it in a circle, when you will see the whole series of black rings going around in a most amusing manner, while the toothed wheel in the center goes in the opposite direction. It will be all the more interesting if you copy the figure on a white card in ink, as it is more easily moved than the paper, and other things are not around it to take away the attention.

A Boy's Tool-Tray.

One of our young friends, "W. R. L.," Stottville, N. Y., sends a very neat drawing of a Tool-Tray, together with a very nicely written letter. We have had an engraving made from the sketch, though on a smaller scale, and are sure many of the boys of the *American Agriculturist* family will be pleased to see Master L.'s Tool-Tray. Most boys have a pocket-knife for their first mechanical tool, and this is carried in the pocket. A hammer usually comes next, and if the work was at all in proportion to the noise it turns out, would be a wonderful tool. Other tools are added, some of which go into the all capacious pocket, while others are kept here and there, usually where they were last used—if one could only recollect where that is. As tools accumulate, there must be, after a while, a place to keep them—a chest is hardly needed yet, and a tool-tray will answer at first. Master "W. R. L." thus describes his Tray!—"It is 18 inches long, 12 inches wide, and 3 inches deep. The central division forming the handle, should be 6 inches high in the center, and worked down to 3 inches at each end. In the center of this a piece is sawed out large enough to admit the fingers to pass through, thus allowing the tray to be carried with ease. In one of the two divisions thus formed, another piece is inserted, making two smaller divisions, and in this, as well as at each end of the tray, places are sawed down to the depth of about 2 inches, to admit the square, saws, and tools of that kind. By placing the saws and square in these slots, they are always held in their proper places. The other tools may be carried on the other side of the tray."—The Tray should be made of ¼-inch stuff. The measurements are all of the inside.—W. R. says: "I have always been very fond of tools, and have always used them more or less, and this tray is one of my own devising, and I find it very convenient for carrying tools from one place to another on the farm."—Here is a strong argument in favor of parents encouraging the boys to become handy with the tools in the shop, accustoming their hands to make, and their wits to contrive, the many little convenient things that go so far in the farmer's every-day life.



BOY'S TOOL-TRAY.

Our Puzzle-Box.

ADDED HEADS.

(To the word which fills the first blank, add a primal letter for the second blank—*e. g.*, "The——made the ——grow finely." "Rain, grain."

1. The little——tore all the——off his sister's dress.
2. We often——through that lovely——.
3. Round the——of the field was a beautiful——.
4. He ran the——into his finger and began to——.
5. The dog had a sore——and was as cross as a——.
6. When I went to the——I took my cousin——with me.

STORE-KEEPER'S PUZZLE.

Five letters are all that are needed to form an important request.
The first and last letter name a vegetable.
The second letter is the initial of a large snake.
The third letter is your own initial.
The fourth letter is the initial of the first name of one of our Presidents.
The fifth letter is the same as the first.
Obey the injunction of my whole.

DOUBLE ACROSTIC.

The initials name a famous General, the finals, where he was defeated.

1. Of little breadth.
2. A city in Pennsylvania.
3. A river in North America.
4. A river of Asia.
5. A city in England.
6. The residence of the Spanish Kings.
7. A river of South America.
8. A territory. JOHN W. WHEATLEY.

CONCEALED BIRDS.

1. I caught the owl in Netley Abbey.
2. Who now rents the Mansion House?
3. The widow Drummond over the way.
4. Her only son keeps it.
5. I think it equal to the very best.
6. Cousin Tom now lets lodgings.
7. He never fails to attend the concerts.
8. Crowds attend nightly.
9. The pond was overgrown with rushes.

ANAGRAMS.

1. Oh! barn feed.
2. Rites abound.
3. Eminent crape.
4. Rail, O big chap!
5. Five fines? No!
6. Candle in it.
7. Fine edict.
8. I suit a bore.
9. I suit Bonum.
10. Laird Clincy.

PI.

Eh how snimd ton shi now nibsuses si ton tif ot eb tinduster thiw throe sel'pope.

ALPHABETICAL ARITHMETIC.

A R E B) I T O P L E F (A B P
I E F I T
I B T O E
I A T T F
L T T F
A R E B
R F I T

BIBLICAL NUMERICAL ENIGMA.

I am composed of 29 letters:
My 1, 12, 19, 4, 13, 28, 15, was a province of Syria.
My 5, 17, 1, 8, 11, 7, 8, was a Corinthian convert under Paul's preaching.
My 8, 21, 16, 4, 24, 10, 14, is a bird which feeds mostly on winged insects.
My 12, 16, 18, 6, 17, 5, 15, is an evergreen tree.
My 16, 12, 1, 25, 3, 26, 20, is a fallen angel referred to in Revelations.
My 17, 1, 27, 9, 12, 26, 14, is a beautiful natural phenomenon.
My 22, 2, 17, 10, 29, 13, 23, was a reservoir of water at the foot of Mount Zion.
My whole is part of a verse of the Bible. ISOLA.

ANSWERS TO PUZZLES IN THE NOVEMBER NUMBER.

NUMERICAL ENIGMAS.—1. Honesty is the best policy. 2. Constantinople, in Turkey.

DECAPITATIONS.—1. Wheat, heat. 2. Ebony, bony. 3. Atom, Tom. 4. Turn, urn. 5. Hour, our. 6. Eat, at. 7. Roar, oar.=WEATHER.

METAGRAM.—*Breath*, in which can be found—hear, bat, hart, rat; hat, heat, herb, heart, rate, tar, tea, bar, ear, earth, era, bath, tear, and tare; are, ate, bare, bet, eat, beat; bate, bathe, hate, and hear.

DROP-LETTER PUZZLE.—1. Groundless. 2. Condescension. 3. Procrastination. 4. Impracticable. 5. Incarcerated. 6. Characteristic. 7. Expostulate. 8. Incapacitated. 9. Disciplinarian.

CROSS-WORD.—Be careful.

ANAGRAMS.—1. Incandescent. 2. Anthracite. 3. Torpedoes. 4. Volunteers. 5. Reservoir. 6. Longitudinal. 7. Abstracts. 8. Pilgrimages. 9. Troublesome. 10. Grievances.

ILLUSTRATED REBUS, No. 470.—I show myself deserving of misfortune in deriding it.

A Cocoanut Tree Afloat.

One of our young friends, "T. A. S.," who lives in Jamaica, thinks that the following may interest his "young fellow readers outside of the tropics." How many of you can tell, without looking, what and where Jamaica is? to what country it belongs, and what its principal city?—"T. A. S." has already given you a hint that he lives in "the Tropics" Let us hope that he may tell us more about tropical matters. Here is his account:

"Sometime last year, when the barometer indicated foul weather in the vicinity, the inhabitants of a small port in one of the Bahama Isles, had their attention di-

rected to a curious object floating in the offing. Some said it was one thing, some another; at length a boat's crew pulled out to the supposed disabled ship, and what do you think it turned out to be? A large and perfect Cocoanut Tree floating upright in the occan! heavy rains had probably loosened the soil on some precipitous hillside on the coast of Cuba or Saint Domingo, and the whole tree, with a mass of earth and stones, enclosed by its thickly matted roots, had slid into the sea, or possibly been washed down by a flooded river—the stones and earth entangled in the roots served to keep the tree upright, and the buoyancy of its immense outspread leaves prevented it from sinking. This tree contained a full crop of fruit in every stage of growth and maturity, from the tiny nutlet, smaller than a hen's egg, to the ripe nut ready to be converted into oil, etc., as well as that intermediate stage when the fruit supplies a deliciously cool refreshing drink and soft jelly-like meat, which I am sure my young fellow readers would enjoy if they should pay a visit to Jamaica, or some tropical land."

Forfeits for Fun.

In the evening games of winter gatherings of young people, and older ones too, it often becomes necessary to punish some, one, or more, of the company by imposing a "Forfeit." The penance should be something that either is not easy to follow out to the letter—that is, has some *catch* in it, or puts the person in a conspicuous and amusing light. In all cases a forfeit should be designed to amuse the company as a whole, and never to offend the person called upon to pay it. In order to illustrate our idea of a good forfeit, and also to furnish suggestions to those who enjoy and take part in such pleasant amusements, we give a few of the forfeits that may be imposed. (1) Put a newspaper upon the floor in such a way that two persons can stand on it and not be able to touch each other with their hands.—This forfeit has the honor of being old, but it was not our good fortune to meet it until a short time ago, and was forced to "give it up." By putting the paper in a doorway, one-half inside and the other outside of the room, and closing the door over it the two persons can easily stand upon it and still be beyond each others reach.—(2) To go out of the room with two legs, and come in with six.—Not difficult if one thinks to bring a chair along on the return.—(3) To act the Dumb Servant.—The person who has the forfeit to pay must act out the answers to the questions put by the master of the ceremonies; as, How do you make bread? How do you eat soup? etc. This forfeit will cause much merriment if proper questions are put.—(4) Put one hand where the other can not touch it.—One can get out of this difficulty by putting one hand on the elbow of the other arm.—(5) Place a pencil on the floor so that one can not jump over it.—May be done by putting it close to the wall of the room.—(6) Put a question that no one can answer with a NO!—This is not hard if one thinks to ask, What does Y E S spell?—(7) Push a chair through a finger ring.—This forfeit is made by putting the ring on the finger and pushing the chair—any other object will do as well—with the finger. This last much resembles the next.—(8) Put yourself through a key-hole.—This was a great puzzle to us for a while, but when a piece of paper was taken with the word "yourself" written upon it, and pushed through the hole, it was all clear. There are many other of these amusing little tricks, but these given will suggest others, and help to make the social winter gatherings the enjoyable times that they should be.

No. 472. Illustrated Rebus.—One of the many very wise sayings given to us in the Proverbs.

A Pile of Winter Wood.

The season for getting together a good, large pile of wood has come, and many of the boys and girls take a lively interest in this important work. It is fun for them to be where the chopping is going on, and to run away with half frightened glee when the trees begin to crack and fall. And then it is such nice sport for the boys to get on to the load—astride a large log, it may be—and ride home. When the pile is finished, the sawing machine comes to saw up the wood, and there is as good as a holiday for the young of the whole neighborhood.

We have been getting up a pile of wood too, and it is our plan to have the boys and girls point out the different kinds of wood that we have gathered together. There are sixteen kinds—rather more than in most wood-piles. The first block we will look at is from one of the finest of American forest trees; not large, bark very thick, young limbs armed with prickles, leavessomething like those of the rose, flowers fragrant, and in large showy clusters, bearing pods in autumn. Do you recognize it?—The second kind is an evergreen, the leaves, like little needles, remaining all winter. It bears cones 2 to 4 inches long. The tree grows in wet ground, and is not very good for wood; we cut it because a road is to be put through where it stood.—Upon a bank near the low ground No. 3 was cut; it is also an evergreen, and a very common one, often growing to a large size. The wood is coarse and light, and full of splinters when split. The leaves are lighter on the under side than above. The branches are used by boys for making bows and whistles.—No. 4 is a wide-spreading and lofty tree, and when given space in an open field, is noted for its grace and beauty. The leaves are notched along the edges, and a little larger on one side than on the other. Boston had a famous tree of this kind until it was blown down and destroyed a few years ago. New Haven is often called the "City of——." There is another kind, the inner bark of which many people like to chew.—Under favorable conditions, No. 5 grows to 30 feet in hight, but it is at most a small tree. The bark is loose, and in thin square patches. In early spring this tree is covered with a profusion of white flowers like a full blown apple-tree. The berries are red in autumn, bitter, and not fit to eat. The *Bark* may help you to distinguish it.—No. 6 is one of the leading trees in many American forests, and makes an excellent fire wood. The bark is smooth, and trees that stand by the road-side are usually carved and disfigured with names and dates. The nuts are larger than, but in shape resembling a kind of grain sown late in the season, from the flowers of which bees make much dark honey. The *blue* kind is a different and much smaller water-loving tree, with tough limbs. This kind has held a high place in the education and correction of unruly youngsters.—No. 7 is too valuable as lumber to be often found in the wood-pile, except in those regions where it is almost the only tree, and where hundreds of men are employed during the winter in getting out the logs. This wood is fine for whittling, white, light, and soft, and is excellent for kindling.—A handsome, rough-barked, slender, yellow-limbed tree, with long drooping leaves, partially fond of the water, is our No. 8. Do you find it? There are a number of kinds of it, one of which is a weeping sort, and often planted in grave-yards. The wood is light and yellow, and not of great value for fuel. The long flexible branches are largely used in basket making, and highly prized by boys for whistles.—No. 9 is a large, broad-leaved tree, with very light, white wood, and tough stringy under bark. The flowers are not showy, but the bees find them and gather the best quality of honey, in the estimation of many. The wood is of little value for fuel, but is used for light lumber, as the thin stuff used in small boxes.—A small tree (we are sorry the artist has forgotten this) that grows in poor sandy soil is No. 10. The botanists say of it, "The cup, very thick....half enclosing the ovoid nut." The more familiar kinds of this group of trees are excellent for fuel and timber, one kind especially important in ship-building.—No. 11 is a medium-sized tree, with dark-brown bark and reddish, slender, spicy, aromatic twigs. There is a kind with white outer bark, which

THE WOOD-PILE.—PICK OUT AND NAME THE 16 KINDS OF WOOD.

may be taken off in great thin sheets. The Indians were accustomed to make many of their canoes from a tree by this name.—There is one of the United States often called after No. 12, because of the tree's unusual thriftiness and abundance along the rivers in that State. The leaves are large and consist of five parts as in a "five-leafed clover," only very much larger. The flowers are large, and in great fragrant bunches, afterwards bearing large, smooth, brown nuts, unfit to eat, within a green shell or covering. This tree is more ornamental in the yard than valuable for timber.—No. 13 is an evergreen, growing in swamps, to the hight of 30 to 70 feat. The wood is exceedingly durable, and well adapted for exposed situations, as fence posts and the like. It is sometimes called by another and a double name.—The best fire-wood in our pile is No. 14, being hard and heavy. The trees do not get very large around, but often quite tall. The wood is very strong, and is highly prized for many uses. The nuts are thick-shelled, and much sought after by the boys, who, when climbing these trees, are likely to tear their clothing on the rough, hard bark.—A pile of winter wood without No. 15 would not be complete, as it is hard, easily split, and very excellent fuel. One kind is important, from the sweetness which it contains, the extracting and condensing of which is the delight of the youth of all regions where this tree grows.—The last, No. 16, is not the best wood for burning, but the tree bears the finest nuts of the temperate zone. No tree like this takes the children to the woods so quickly after the frosts come. No tree gives so much trouble to the mother who has to patch and mend. No tree gives sharper spines or prickers for the fingers of the early and impatient visitor. No boy will suffer more and *sometimes* seem to get so little as with our last tree.—Thus, we have tumbled around and over our wood-pile (a single block, the artist says), and if any one is not able to tell all the kinds, it will not be because we have not tried to help by both pen and pencil.

ON THE POND IN WINTER.

Every season of the year brings its peculiar pleasures and pastimes, and none has a longer and better list than winter. It is not necessary for me to say to the boys and girls that ice furnishes fun "for the million," just because it is so smooth and slippery—if it were sticky as mud or dough, then half the joys of the out-of-door sport of winter would all be spoiled. How splendid it is that when the water gets to a certain coldness it passes into that beautiful, solid, crystalline form which we know as ice! and then the feet are shod with narrow strips of steel, and away go the happy skaters for a race. That boy or girl who has not lived where ponds and rivers, lakes and mill-ponds, "freeze over," or living there, has not joined in the fun of a skating party, does not know how near the expert, easy, graceful skater comes to the joy of a fast-flying bird. The artist has given you a scene upon the ice that none can fail to appreciate. The small boy with his old "swan-neck" skates and awkward strides; the graceful older brother and sister, or friend, with better skates and greater skill, the patient adjustment of the straps, etc., are all shown to life; but there is one thing which, though just as natural as all these, has been left out, and well it may—the fall! How it hurts to have the feet move on much faster than the head, until—and it don't take long—the stars shine with a peculiar lustre, and one looks to see if he is out of sight. Again, the skating may be attempted before the ice is ready, and the bold and fearless youth often finds himself a wetter if not a wiser boy. If the pond is shallow, and the bottom soft and muddy, why! it is not so very dangerous; but then it is, to say the least, provoking. But what would skating be without a fall, a bump—a regular *thump*—and a little danger now and then!

UNCLE HAL.

WOOD SOLE SHOES.

They wear three times as long as leather-soled shoes. Keep the feet perfectly dry and warm, and more easy to the feet, being shaped to suit the action in walking. They are particularly adapted to Miners, Farmers, Butchers, Dyers, and all classes of Laborers.

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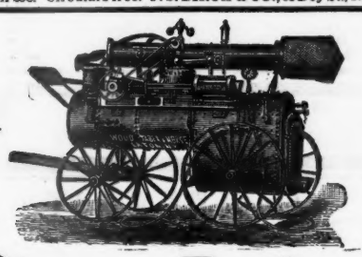

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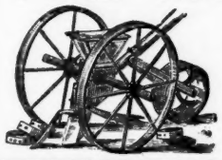

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Grinds three times as fast as any other mills. Always successful. Over 500 First Premiums and Medals. Over 15,000 in use. They do not clog or heat; grinds 60 bushels per hour. All successful Iron Feed Mills INFRINGING OUR PATENTS. Beware: Buy none but the best. Remember the Courts have sustained our Patents. Also the best Wind Mills, Corn Shellers, Horse Power Wood Saws, Fanning Mills, and Pumps. Address CHALLENGE MILL CO., Batavia, Ill.

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All Iron but the Hopper.

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CAN BE RUN BY ANY POWER.

Capacity from 6 to 80 bushels per hour, according to size. Send for Catalogue and prices.

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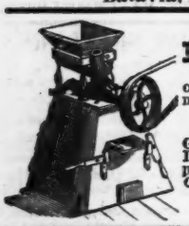
THE PREMIUM FARM GRIST MILL



Has superior claims over all others. The grinding parts are made of

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Is simple, durable, and cheap. Grinds all kinds of grain rapidly. Is adapted to all kinds of horse powers. *Send for Descriptive Circular.*

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BARNES' PATENT FOOT POWER MACHINERY.

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COMPLETE OUTFITS for Mechanics and Amateurs.

MACHINES ON **TRIAL** IF DESIRED.

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CHEAPEST AND BEST ROOT CUTTERS

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combining the latest best improvements, and

GALE'S HAY CUTTERS,

both cylinder and lever. For full description send for illustrated catalogue and price list. Address

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THE BELLE CITY FEED CUTTER.

The Best Feed Cutter in the World.

The only one that runs light enough for Wind-Power.

Send for circular, references, &c. Name this paper when you write.

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Will mend and make your chains of all sizes without tools. Inquire at your hardware stores, or send to

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THE BALE IS PATENTED AND WILL SELL FOR MORE MONEY.
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WITH

Patent Level Tread

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SPEED REGULATOR.

Heebner's Improved Little Giant Threshers.

HEEBNER & SONS, Lansdale, Mont. Co., Pa.

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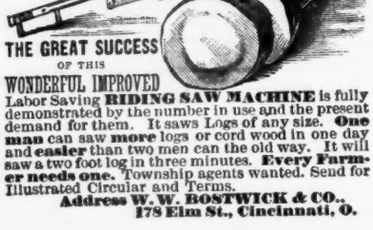

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WONDERFUL IMPROVED Labor Saving **RIDING SAW MACHINE** is fully demonstrated by the number in use and the present demand for them. It saws Logs of any size. **One man** can saw **more** logs or cord wood in one day and **easier** than two men can the old way. It will saw a two foot log in three minutes. **Every Farmer needs one.** Township agents wanted. Send for Illustrated Circular and Terms.

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Over 3,000,000 in Use.

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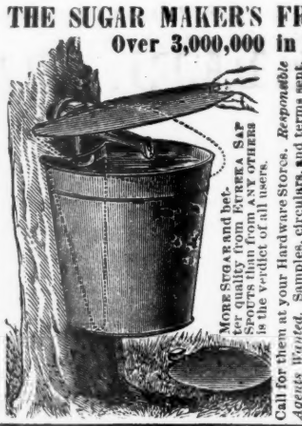

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Call for them at your Hardware Stores. *Responsible Agents Wanted.* Samples, circulars, and terms sent, post-paid, on receipt of 20 cents. Address

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VICTORIOUS AT

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25 Years in Use.

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17 Sizes—1 Man to 45 Horse Power.

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$3,500,000 worth now in Use.

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THE CHAMPION
Is the Best Wind-Power in the Market.

Is perfectly self-regulating, runs no faster in a gale than in a light wind, is very powerful, and never blows away while the tower stands.

We also manufacture the **Iron Screw Wind Mill,** and the Celebrated **Star Wood Pumps,** with porcelain lined iron cylinders, wood eave-trough, tubing, etc., etc.

Send for Catalogues.

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BUY THE BEST.
Myers' Improved Wind Mill

The Mill has a solid wheel built expressly to stand any storm, and when in motion moves as regular as a steam engine. **Perfectly balanced** on the derrick in or out of gear. Pronounced by the best mechanics to be **superior to all other Mills.** No farmer, stock-raiser, or dairyman should be without one for pumping water for stock, grinding feed of all kinds, churning, and many other purposes. Send for a full descriptive circular.

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Montgomery's Improved Rockaway Fan.
232 First Premiums. 15 Silver Medals.

Gold Medal at Md. Institute in 1878, and 15 First Premiums at other Fairs.

No good Farmer can afford to be without one of these Fans! This universally known Fan has been victorious in every contest, and has the approval of thousands of Farmers all over this country. It is the best and cheapest Fan made for the farmer and planter. It is the only Fan that will effectually take out of wheat the great Virginia trouble "Partridge Pea." Prices reduced. Send for circulars and price lists to the manufacturers,

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Manufacturers and Dealers in Standard Goods, Gen'l Agts. for **Cornell Sheller, Big Giant Corn and Cob Mills, Studebaker Wagons, &c.**

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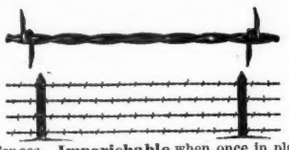
STEEL BARB FENCE,

Solves the **FENCE** Problem by meeting all the requisites of

THE PERFECT FARM FENCE.

Every Land Owner should not fail to examine the merits of this fence. It is cheaper than all others. Easiest handled, and in fact just what the people of the treeless States have needed for years.



To All Inquirers. It is an impassable barrier, yet harmless. Prohibits t espassing. It can be put up by any one, and is compactly put up for transportation. In fact, it is the only fence dog and wolf proof.

Cheaper than Wooden Fences. **Imperishable** when once in place. **Indestructible** by the Elements. Wastes no soil by SHADE. Has **no Weedy Fence Borders. Shelters no Enemies of the Crops. A Protection** at all seasons. It is **easy of Construction.** It needs **no repairs.** Accumulates **no snow-drifts.**

A STEEL THORN HEDGE.

Impassable Barrier. Prohibits all Trespassing. It can not be destroyed by fire, wind, or flood.

100,000 miles of Barb Fence have been erected in 1876, 1877, 1878. Agriculturists, Herdsmen, Sheep Husbandmen, Ranchmen, Vineyard Proprietors, Orchardists, Nurserymen, Railroad Companies, Road Proprietors, and all owners and occupants of soil and areas to be protected.

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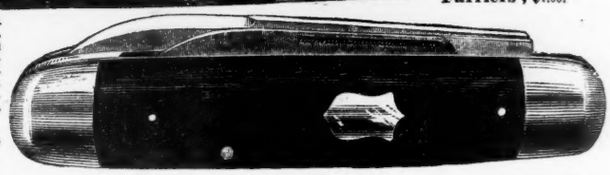
AN OLD-FASHIONED KNIFE.

Made of **Razor Steel, Hand Forged,** and made especially for rough work; blades very thick. No corners on handle to wear pockets. **By mail, postage paid, 75 cts.** Soft or flawy blades we replace **free.**

For lighter work we have knives of equally good steel, 50 and 60 cts. One-blade, like picture, 50 cts.; lighter 1-blade, 25 and 35 cts.

Pruners: Medium, 75 cts; **Our Best,** 8 inches when open, oil temper and tested, $1.

BUDDING, 65 cents; **Farriers',** $1.00.



This cut shows new knife, No. 21, strong, but not clumsy. Price, 75c. Same, 3-blade, $1.00. **Pen Knives:** Gent's 3-blade, $1.00. Fine pearl handle, 2-blade, $1.00. Congress knife (our finest), $1.50. Ladies' 1-blade, 35c.; 2-blade, 50c. List **free.** Discount to dealers. Address

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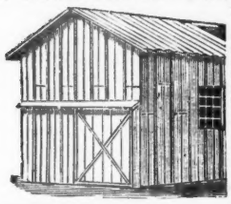
FIRE-PROOF FARM BUILDING.



FIRE, WATER, & WIND-PROOF. Can be applied to old or new buildings by an ordinary mechanic or laboring man. Adapted to all climates and seasons. The cheapest and best covering for buildings ever made where durability is desired. See article *Am. Agriculturist*, Nov., 1879, page 464. Information free. Address

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Threshing Engines, 8, 10, 15-Horse—A No. 1 Always. Portable, Traction, Stationary.
J. I. CASE & CO., Racine, Wis.,
Annually make and sell more Threshing Machines than any firm in the world. Ask for Catalogue; they cost nothing.

Reliable SEEDS

R. H. ALLEN & CO. NEW YORK

For 1880.

Send stamp for **R. H. ALLEN & CO.'s Seed Catalogue.** Address
P. O. Box 376, N. Y. City.

THE HARTFORD AUTOMATIC PUMP.

Water Driven to any Hight and Distance by Compressed Air.

Country Houses Supplied Cheaply and Certainly for Bath Rooms, Water Closets, Hot and Cold Water Faucets, etc.

Plenty of Fresh Water for Stock on Farms. The best Pump for Irrigating, supplying Railroad Tanks, and for Mining purposes.

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EZRA BROOKS,
Manufacturer of the Hartford Automatic Pump,
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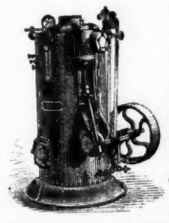

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Compact, Substantial, Economical, and Easily managed. Guaranteed to work well and give full power claimed. Engine and Boiler complete, including Governor, Pump, &c., (and boxing), at the low price of

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4½ " " ... 245.00
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Put on Cars at Springfield, Ohio.

JAMES LEFFEL & CO.,
Springfield, Ohio,
or 109 Liberty St., New York City.

Early Prolific and Reliance,

the **most certain** and **best paying** Market Raspberries, 12 acres now in bearing on our grounds. **150,000** plants for sale. **200,000** Cinderella. **200,000** Continental. **200,000** other fine varieties of Strawberries, including **Sharpless, Miners, Glendale,** etc. Lots of other good things. Prices low. See new descriptive circular.

GIBSON & BENNETT, Woodbury, N. J.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from Page 8.

In justice to the majority of our subscribers, who have been readers for many years, articles and illustrations are seldom repeated, as those who desire information on a particular subject can cheaply obtain one or more of the back numbers containing what is wanted.

Back numbers of the "American Agriculturist," containing articles referred to in the "Basket" or elsewhere, can always be supplied and sent post-paid for 15 cts. each, or $1.50 per volume.

Bound Copies of volume 38, and of every previous volume back to Vol. XVI. (1857), neatly bound, with gilt backs, Index, etc., are supplied at $2 each (or $2.30 if to be sent by mail). See Publishers' Notes, 2d cover page.

Clubs can at any time be increased by remitting for each addition, the price paid by the original members; or a small club may be made a larger one at reduced rates, thus: One having sent 6 subscribers and $7, may afterwards send 4 names more and $3, making 10 subscribers for $10.00; and so for the various other club rates.

Terms to New South Wales, New Zealand, Australia, Africa, etc.—To several inquirers. Under the latest revision of the Postal Union Regulations the price of the *American Agriculturist*, (either English or German edition), including postage *prepaid* through, will be covered by 7 shillings sterling per annum. This applies to the above countries, and to all others embraced in the General Postal Union. The simplest mode of remittance is by Postal Money Orders, payable in London, to the order of Orange Judd Company. These can be readily cashed in N. Y. City at a slight discount, which the publishers will cheerfully pay. For Club rates, (postage included), see our second cover page, and reckon 22 cents to the shilling sterling.

Hoose in Calves.—"H. C. B.," W. T. The so-called "diptheria" which killed your calves is doubtless a parasitical disease known as *husk* or *hoose*, otherwise *vermicious bronchitis*. It is common among calves and lambs which feed in marshy or wet pastures, and often in other pastures where older animals have run. The disease is caused by the presence of white thread-worms in the air passages, which are often so numerous as to cause suffocation. The remedy is to give Turpentine in one ounce doses in milk, every morning, for a week or ten days: or to give Sulphur in 2 dram doses, every day for 3 or 4 weeks. The whole system must be impregnated with the medicine, which passes off by the lungs and the mucous secretions, but kills the worms with which it comes in contact.

How Many Hogs to an Acre of Clover?—"E. P.," Taunton, Mass. That depends on the kind of hogs and the sort of clover. An acre of good clover, that would cut two tons of hay, should afford pasturage for 10 hogs of 200 pounds each, if they would not root it up. It would keep more, if the clover were cut and fed to the hogs in pens, and a little meal slop given for drink.

Bone Meal is a valuable but slowly acting manure. Some farmers who have used it with little or no increase of the crop, the first year, have been disappointed. Bone, when used as a fertilizer, is not washed out: a great advantage in porous or leachy soils. The finer the meal is ground the quicker it is used up by vegetation—coarse meal may make its presence felt upon the crops for several years after its application.

Lice from Birds.—"J. C. E.," Clinton, Pa. Lice from poultry and birds will greatly annoy horses and cattle, and cases have been known in which horses have been so badly infested with them as to die under the infliction. But it is only the mature insects which give trouble. They will not breed upon any quadruped, and if the source of the annoyance is removed, the effects will be only temporary. Poultry, sparrows, swallows, owls, and other birds are usually infested with the minute lice which do the mischief. The remedy is to clear these out from stables and barns, and if necessary brush the infested animals thoroughly with a mixture of lard and kerosene oils. Smear a brush with the oils and shake it out thoroughly, and then give the coat a vigorous brushing.

Poultry Exhibitions for January, Etc.

VERMONT.

Champlain Valley Poultry Ass'n Burlington...Dec. 30-Jan. 1
Wide Awake Poultry Club.....St. Johnsbury Dec. 30-Jan. 1
Vermont State Poultry Ass'n....Rutland..... ...Jan. 6- 9

MASSACHUSETTS.

Cent al Mass. Poultry Ass'n.....Worcester.....Jan. 20-23
Middlesex Poultry Ass'n.....Lowell.....Dec. 29-Jan. 2
Southern Mass. Poultry ..ss'n....Fall River.....Jan. 13-17

RHODE ISLAND.

Rhode Island Poultry Ass'n,....Providence.....Feb. 4-11

CONNECTICUT.

Meriden Poultry Club.....Meriden.....Jan. 6- 8

NEW YORK.

Cortlan ' Co. Ass'n.....Cortland .....Ja . 20-23
Empire State Poultry Ass').....Syracuse.....Jan. 29-Feb. 5
Eastern N. Y. Fanciers' Ass'n....Albany.....Jan. 20-27

PENNSYLVANIA.

Central Poultry Ass'n.....Pottsfield.....Jan. 6-10
Huntington Poultry Ass'n.....Huntington.....Jan. 12-15
Lancaster Poultry Ass'n.....Lancaster.....Jan. 2- 4
Lehigh Valley Ass'n.....Allentown....Dec. 30-Jan. 3
Luzern Pet Stock Ass'n.....Wilkesbarre..Dec. 31-Jan. 2

INDIANA.

Northern Indiana Poultry Ass'n.Fort Wayne.....Jan. 27-30
State Poultry Ass'n.....Indianapolis.....Ja . 8-15

ILLINOIS.

Western Poultry Club.....Bloomington.....Jan. 16-23

IOWA.

Council Bluffs District Ass'n.....Council Bluffs....Jan. 20-23

CANADA.

Montreal Pet Stock Ass'n.....Montre l.....Feb. 4- 6
St. Johns Po .ltry Ass'n.....St. Johns, N. B....Jan. 20-22

A Most Interesting and Important Article is given on page 13. If one half the confident expectations of the U. S. Fish Commission is realized, untold millions will be speedily added to the food production of our country, at trifling cost. Not only lakes and streams, but the pools of bog-meadows and sloughs will be the best food-producing portions of the country. The gentlemen conducting the U. S. Fish Commission, while enthusiastic, are not the men likely to indulge in groundless theories. They have accomplished great things in other directions, and we are much inclined to put confidence in their promises for the Carp. Read the article.

A House for 30 Ducks.—"C. H. W.," Yarmouth, Me. Ducks are very dirty birds in a house and need to have considerable room. A flock of thirty will require a house 12x12 feet, which should be so made that it can be easily cleaned out. Nest places should be provided on the ground, hidden by a frame around three sides.

The Breed for Market Pigs.—"Rose Farm," N. J. It is a matter of dispute, and always will be, which are the best breeds of pigs for special uses. The Berkshire is black but comely, and perhaps the most profitable pig of all the breeds for pork at any age. The Essex is also black, and some think that the best, but it has the objection of having too much fat. Some will have only white pigs and the Suffolk is generally considered the best of the small white breeds; the small Yorkshire is a more modern variety, and perhaps owes some of its good qualities to a Suffolk cross. If so, it would be fair to call the Suffolk a better kind than the Yorkshire. But there are some who think differently, and no one can say confidently that this or that is the best except from his own point of view and as a matter of opinion. The small white breeds have become so much crossed and mixed, that at the English exhibitions they are no longer classed distinctively but collectively as "small white breeds."

Poultry Disease.—"Minnie C." sends no name or address. We do not usually answer such letters, but in this case of a little girl, we make an exception to our rule. The disease is doubtless the prevalent "cholera," so called; it is a disease of the liver and intestines, a typhoid or intestinal fever, which ends in gangrene. The fowls sit about, turn yellow about the head, void green or yellow matter and do not eat. There is no cure; the disease is very infectious and the best way is to kill every sick fowl as soon as it is discovered. Remove the well birds to a fresh place, that is clean, dry, and airy, and feed them on boiled wheat with a small tablespoonful of fine, dry lime stirred in the mess for each dozen fowls.

Dr. Lawes' Wheat Crop for 1879.—The following interesting figures are condensed from a communication by Dr. J. B. Lawes of Rothamsted, England, to the "North British Agriculturist." Within his memory England has never before had such a bad wheat crop as that of 1879, certainly not since 1816. Dr. Lawes is one of the most eminent of agricultural experimenters, his results being of peculiar value from their accuracy in all the details and the length of time over which the experiments have extended. He has grown the same kind of crop on the same piece of ground, and same condition as to fertilizing, and some with no manure for 36 years. The tables, which it is not necessary to reproduce, show that the continuously unmanured plots the present year gave only 4¾ bushels per acre of wheat, while the average for the past 10 years on the same plots, was 11 bushels; and 14⅞ bushels per acre, for the 17 years just preceding the last ten years. A *gradual* decrease is to be expected, but not the falling off which occurred in 1879. The plot receiving 14 tons to the acre of farm-yard manure annually, gave only 16 bushels for the last year, against 34 per acre as the average for the preceding 27 years. Of the three artificially manured plots one gave 16¼ bushels, or about half the average; the second, more highly manured, gave 20⅛ bushels, likewise a half average. The last and most highly fertilized plot, gave 22 bushels per acre, also about a half average. In 1863, the average of the three artificially manured plots was 55 bushels. In 1879, the very same plots and fertilizers, had an average of 19⅛ bushels, and each bushel weighed 9 pounds less than in 1863.

Dr. Lawes concludes by stating, "We have here a striking illustration of how great is the influence on the results of the farmer's efforts, of circumstances entirely beyond his control, after he has employed all the resources at his command to obtain a good crop."

Sowing Forest-tree Seeds.—"W. J. A. B.," Kans. We hope to give an article on this subject, before the season is at hand for sowing. Just now, the point of greatest importance is, to preserve the seeds, so that they may germinate when sown. If many seeds, the chestnut for example, are left exposed to the air, they become so dry that they can not be restored—killed in fact. All the seeds you name are best preserved in damp sand, and any others about which you are in doubt, should be treated in the same manner. While the sand should be "damp," it must not be *wet*. Sand as it is freshly dug from the bank, is usually in the proper condition. Enough should be used to keep the seeds well separated, so that they may not be in masses together, but equally distributed. An equal bulk is usually enough, but no harm can come from using more. The mixed sand and seeds must be kept in a cold place. In a warm one, the seeds would soon germinate and be lost. Most seeds will not be injured by freezing, and some benefited. They should be looked at occasionally, to see that the sand does not get entirely dry; if quite dry, enough water should be added to make it as moist as at first. Towards spring, some kinds may begin to germinate, and must be sown at once; indeed, early sowing is best for all. Keep the seeds during winter where rats and mice can not get at them.

Salt for Black Knot.—"D. D. S.," Malden, Ulster Co., N. Y., asks if salt will cure black knot on plum trees. From the nature of the knot, which is described in full on page 22, we do not see how salt can be made to reach the real trouble, which is at work long before it appears as the knot. The only way is, to cut off the affected branches, and burn them. Cut several inches below the knot, as the threads run down some distance.

A Cow with Sore Eyes.—"L. K.," Glen City, Pa. When a cow is troubled with inflamed eyes, a cough and inflammation of the udder, with stringy milk, it indicates fever with disturbance of the lungs and circulation. The treatment should consist of a dose of 12 ounces Epsom Salts, repeated the third day, and after that 4 drams of Saltpetre, given daily; with warm bran slops, and good nursing, until the fever completely disappears.

Electricity in Bee Keeping.—Herr Freiwirth, a bee keeper, and correspondent of the *Deutsche Presse*, has recently perfected an apparatus for quieting bees by electricity, by which they become as lifeless creatures, and remain so for from ten minutes to a few hours, the duration of the effect depending upon the strength of the current. He has used the machine for hiving the bees, and for working among them while they are in the hive, and finds that electricity does not injure the bees at all, but renders them, in an instant, as easy to handle as so much lifeless matter. We hope that some of our bee keepers, who have devised so many improvements in the apiary, will test the matter; if all that we have quoted is true, it will be of great value. Many would keep bees, if it were not for the dread of stings; this use of electricity would practically remove this obstacle.

The Apple Leaf Fungus was figured and described last month, p. 468, and we have since then received several interesting letters concerning it. Mr. "P. P. H.," Union, Munroe Co., W. Va., writes: "I have observed this Fungus for several years, and, of course, read the article with interest. We had a young Crab-apple tree transplanted to our yard, but the early frosts deprived us of its beautiful bloom; and the sickly, blotched foliage, made it a pitiable object among roses and other shrubs. We often discussed its removal, but the desire to see it covered with its unrivaled blossoms, led us to exercise patience. Two small Red Cedars were brought and placed near the Crab-apple, and these were soon covered with the 'Cedar Apple.'....It would seem from this that the spores were communicated from the Crab-apple tree. You say, by destroying the Cedar fungus, that upon the apple may be eradicated. Would it not be better to begin with the 'cluster cup,' the first stage of its existence?"—It would be better, if practicable. It is a much easier matter to collect the Cedar apples than the leaves of the apple trees; besides, if the leaves are picked off in early spring, it would injure the tree.—"T. C. W.," Manhattan, Kansas, sends specimens of the fungus on the leaves and twigs of a wild Crab-apple tree, and says: "The tree grows thriftily, and looks prettily in the spring, but after a while this fungus comes on it so badly, that many of the leaves curl up and drop off, and *whenever it attacks the twigs, all above the fungus dies*....There are Red Cedars all around, and plenty of Cedar apples."—We should, as this Crab-apple tree is near an orchard, cut it down, and the Cedar trees, if near by, should be looked after.

Through a Brick.—In September last, page 349, an engraving was given of a potato perforated by the root-stock of Quack or Couch-Grass (*Triticum repens*). It is stated in the article that another and more slender grass, the Mexican Drop-Seed (*Muhlenbergia Mexicana*), has similar, though more slender, root-stocks, which in their onward growth through the soil, penetrate any soft obstacle they may meet. Since the perforated potato was published, a friend gave us a specimen in which this root-stock had made its way through a brick! "Seeing through a brick" is a wonderful performance sometimes shown to "greenhorns," but we long ago showed the Boys and Girls how it was done. There is nothing wonderful about the passage of the root-stock through this hard substance, when we find that there was a hole through the brick. The brick was an imperfect one; probably a *small* twig or straw was in the clay, which, burning out, left a hole through which the grass found its way.

A Nurseryman's Society.—"L. B. S." There is such a Society; we think it is not confined to nurserymen, but includes those engaged in the sale of seeds and plants of all kinds, and has for its objects, as we understand them, the better acquaintance of those engaged in kindred pursuits, and such mutual understanding as shall help one another and protect one another from the various frauds practised upon such dealers. The officers for 1879-80 are: President, T. S. Hubbard, Fredonia, N. Y.; Vice-Pres't, J. T. Lovett, Little Silver, N. J.; Sec., D. Wilmot Scott, Galena, Ill.; Treas., A. K. Whitney, Franklin Grove, Ill.; Exec. Com., with the Pres't and Sec., S.W. Hoover, Dayton, O.; Franklin Davis, Baltmore, Md.; Geo. B. Thomas, Westchester, Pa. We do not know the conditions of membership, but presume that any nurseryman, seedsman, or florist, in good standing, will be welcomed to the Society. The next meeting will be held at Chicago, Ill., June 16-18, 1880.

Do Snakes Swallow their Young?—Several years ago, at the request of an eminent naturalist, we asked for experience upon the above question. And abundant evidence was given to show that some snakes do take their young into their bodies. After this, it was asked if this was done by venomous snakes. On this point, "W. F. M.," Arispie, Kans., writes: "that while he and his boy during the past season killed 19 Rattle Snakes, without finding any young within, but one of his neighbors killed a 'Rattler' containing 13, and another killed one containing 4 young snakes, which, so soon as liberated, by coiling up, rattling, and striking out at persons, showed their venomous 'Rattle Snake' nature."

Seed Corn.—If any one's last crop of corn was not of as good quality as desirable, and a neighbor or distant friend has some better sort, make it a business to get some of it for seed, *now*, and have it ready when the day of planting comes. In selecting, note the time of ripening, size and number of ears on stalk, size of stalk, quality of the grain, and all other important points.

To Prevent Powder-Post.—The honey-combed, powder-covered, worm-eaten, and therefore worthless state, which hickory timber will many times assume if not properly cared for, is caused by the larvæ of the *Lyctus striatus*, an insect that deposits its eggs in the soft outer wood of the dead tree, mostly during the months of May and June. If the trees are cut at a season when the soft wood becomes dry and hard before the time for the insect to make its appearance, there is no danger from this pest. Hickory cut in the winter season will generally be free from attacks, but to make sure, it is best to remove the bark, and even split the timber that it may become thoroughly seasoned. Keep it in a dry place.

Illinois Agricultural Institute.—The Agricultural Department of the Industrial University, Champaign, Ill., will hold its annual course of public Lectures and Discussions during the last week of January. Greater facilities for gaining information pertaining to the farm will be given than in the past, and a much larger attendance is anticipated. For farmers who have a longer time at their disposal a course has been especially arranged to extend from January 7th to March 23d, during which time daily lectures and other instructions will be given on practical farm matters.—[It is a matter of taste to be sure—but we think it not good taste for an institution called an "University" to send out its circulars in *red* ink!]

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our record kept daily during the year, show at a glance the transactions *for the month ending Dec. 12th*, 1879, and for the corresponding period last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

	Flour.	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats*
RECEIPTS.						
25 d's *this* m'th	526,000	6,127,000	4,036,000	589,000	602,000	916,000
26 d's *last* m'th	484,000	10,170,000	4,116,000	557,000	1,193,000	1,212,000
SALES.						
25 d's *this* m'th	465,000	23,817,000*	5,902,000*	354,000	611,000	1,805,000
26 d's *last* m'th	473,000	26,839,000*	6,347,000*	395,000	673,000	1,796,000

* Including sales for forward delivery.

2. *Comparison with same period at this time last year.*

	Flour.	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
RECEIPTS.						
25 days 1879..	526,000	6,127,000	4,036,000	589,000	602,000	916,000
26 days 1878..	475,000	4,236,000	2,434,000	387,000	743,000	831,000
SALES.						
25 days 1879..	465,000	23,817,000	5,902,000	354,000	611,000	1,805,000
26 days 1878..	504,000	5,936,000	4,094,000	411,000	609,000	1,302,600

3. *Exports from New York, Jan. 1, to Dec. 9.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
'79	3,441,040	62,212,007	34,105,000	4,013,000	167,000	523,000	381,000
'78	2,433,166	52,166,352	25,844,569	3,970,463	1,518,667	3,645,001	425,937
'77	1,386,875	19,333,574	25,276,390	1,992,620	1,938,956	246,355	454,056
'76	1,823,650	23,606,295	16,339,741	1,281,929	88,097	619,118	689,246
'75	1,789,299	25,054,035	12,495,349	152,925	1,505	133,754	415,019
'74	2,055,423	33,700,159	18,329,781	641,661	3,320	110,331	425,533

4. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
Dec. 8, '79..	9,240,862	1,240,704	422,873	454,157	432,106	175,305
Dec. 10, '78..	3,910,457	3,520,355	602,206	905,577	1,235,994	133,069

5. *Tide-water Receipts at Albany, from opening of navigation to Nov. 30:*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
'79..	8,000	29,206,100	18,392,300	1,985,900	2,679,900	1,055,900	396,700
'78..	13,400	26,486,006	25,167,800	2,103,600	3,192,300	5,062,500	486,800
'77..	29,100	12,743,500	23,631,100	1,282,700	5,530,900	4,228,700	607,500
'76..	37,100	11,801,100	11,386,600	762,700	3,858,000	3,167,900	735,600
'75..	113,600	21,335,200	8,581,800	250,900	3,833,600	3,108,300	659,800

CURRENT WHOLESALE PRICES.

	Nov. 13.	Dec. 12.
FLOUR—Super to Extra State ₱ bbl	$4 50 @ 5 75	$5 40 @ 6 50
" Super to Extra South'n.	4 50 @ 7 50	5 40 @ 6 00
" Extra Genesee	5 50 @ 6 75	6 25 @ 7 50
" Superfine Western	4 50 @ 5 00	5 40 @ 6 00
" Extra Western	5 15 @ 8 50	6 00 @ 9 25
" " Minnesota	5 15 @ 8 50	6 00 @ 9 00
BUCKWHEAT FLOUR, ₱ 100 lbs	2 35 @ 2 75	2 30 @ 2 65
BUCKWHEAT, per bush	60 @ 62	— @ 65
RYE FLOUR, Superfine	4 85 @ 5 65	4 85 @ 5 50
CORN-MEAL	2 65 @ 3 40	2 75 @ 3 35
CORN-FLOUR, per bbl	4 00 @ 4 50	4 20 @ 4 50
OAT MEAL, ₱ bbl	4 50 @ 6 50	5 25 @ 7 25
WHEAT—All kinds of White	1 21 @ 1 41	1 42½@ 1 62½
" Red and Amber	1 22 @ 1 40	1 40 @ 1 62½
" Spring	1 07 @ 1 39	1 15 @ 1 50
CORN—Yellow	60 @ 67	65 @ 70
" White	60 @ 68	65 @ 70
" Mixed	57 @ 59	64 @ 66½
OATS	40 @ 49	48 @ 55½
RYE	85 @ 90	90 @ 97
BARLEY	70 @ 98	75 @ 1 10
HAY—Bale, ₱ 100 lbs	35 @ 85	45 @ 95
STRAW, ₱ 100 lbs	30 @ 70	40 @ 85
COTTON—Middlings, ₱ lb	12¾@ 12¾	13¾@ 13½
HOPS—Crop of 1879, ₱ lb	35 @ 47	30 @ 43
" " 1878, ₱ lb	7 @ 18	7 @ 20
" olds, ₱ lb	4 @ 10	4 @ 10
FEATHERS—Live Geese, ₱ lb	35 @ 48	37½@ 52½
SEED—Clover, West. & St. ₱ lb	8½@ 10	8½@ 10¾
" Timothy, ₱ bushel	2 60 @ 2 85	Nominal.
" Flax, ₱ bushel	1 50 @ 1 60	Nominal.
TOBACCO, Kentucky, &c., ₱ lb	3 @ 14	3 @ 14
" Seed Leaf, ₱ lb	6 @ 35	6 @ 35
WOOL—Domestic Fleece, ₱ lb	25 @ 50	27½@ 53
" Domestic, pulled, ₱ lb	21 @ 48	26 @ 52½
" California	16 @ 36	13 @ 40
TALLOW, ₱ lb	7 @ 7¾	6¾@ 7
OIL-CAKE—₱ ton	30 50 @ —	35 50 @ —
PORK—Mess, ₱ barrel	10 90 @11 25	12 50 @12 85
" Extra Prime, ₱ barrel	8 25 @ 9 25	— @ —
BEEF—Extra mess	11 00 @11 50	11 00 @11 50
LARD, in trcs. & bbls, ₱ 100 lb	7 05 @ 7 20	7 60 @ 8 35
BUTTER—State, ₱ lb	18 @ 40	16 @ 37
" Western, poor to Fcy, lb	16 @ 40	15 @ 37
CHEESE	4 @ 13¾	4 @ 13¾
EGGS—Fresh, ₱ dozen	20 @ 24	16 @ 26
POULTRY—Fowls, ₱ lb	5 @ 11	7 @ 12
" Chickens, ₱ lb	5 @ 12	7 @ 12
" Roosters, ₱ lb	4 @ 5	3½@ 5
Turkeys—₱ lb	8 @ 10	6 @ 12
Geese, ₱ pair	1 00 @ 1 50	1 00 @ 1 50
Ducks, ₱ pair	40 @ 50	40 @ 70
" ₱ lb	10 @ 13	8 @ 14
RABBITS, ₱ pair	25 @ 35	30 @ 35
HARES, ₱ pair	30 @ 40	35 @ 40
DUCKS, Wild, ₱ pair	20 @ 2 00	20 @ 2 50
QUAIL, ₱ dozen	2 25 @ 2 50	1 50 @ 2 25
WOODCOCK, ₱ pair	40 @ 50	— @ —
PARTRIDGE, ₱ pair	50 @ 1 00	20 @ 50
SNIPE, per doz	40 @ 2 00	— @ —
PIGEONS, ₱ doz	1 25 @ 2 25	2 00 @ 2 50
GROUSE, ₱ pair	60 @ 1 00	60 @ 1 00
VENISON, ₱ lb	7 @ 16	9 @ 12
APPLES, ₱ barrel	1 50 @ 3 25	1 50 @ 3 00
PEARS, ₱ bbl	1 50 @ 4 75	2 00 @ 4 00
QUINCES, @ bbl	3 00 @ 6 50	— @ —
GRAPES, ₱ lb	2 @ 5	1½@ 5
POTATOES, ₱ bbl	87 @ 1 75	87 @ 2 00
" Sweet, ₱ bbl	1 25 @ 2 25	2 00 @ 3 25
TURNIPS ₱ bbl	75 @ 1 00	75 @ 1 00
TOMATOES, ₱ box	— @ —	— @ —
BEANS—₱ bushel	1 80 @ 2 10	1 80 @ 2 15
PEAS—Canada, in bond, ₱ bu	— @ 80	— @ 85
" new, green, ₱ bag	1 75 @ 2 00	1 75 @ 2 25
BROOM-CORN	2½@ 6½	4 @ 9
CARROTS, ₱ bbl	75 @ 1 00	75 @ 1 12½
BEETS, ₱ 100 bunches	75 @ 1 00	75 @ 1 00
CABBAGES—₱ 100	3 00 @ 4 50	3 50 @ 5 00
CAULIFLOWER, ₱ doz	2 00 @ 6 00	— @ —
ONIONS—₱ bbl	2 50 @ 3 50	2 50 @ 4 00
CRANBERRIES, per bbl	4 50 @ 7 25	4 50 @ 7 00
SQUASH, ₱ bbl	50 @ 1 50	75 @ 1 50
CELERY, per dozen bunches	1 00 @ 1 25	75 @ 1 00
PUMPKINS, ₱ 100	3 00 @ 6 00	4 50 @ 8 00

Business in Government Securities, and Railway and Miscellaneous Bonds, Mortgages, and Share property has been again on the increase through recent weeks, and the speculative temper has developed more confidently, leading to renewed firmness, and buoyancy in prices; favored by the prevalent ease in the Money Market....In Produce and Merchandise, oparations have been also on a comparatively liberal scale,—notably so in Breadstuffs, Provisions, and Cotton, but at very variable quotations, the changes having been frequent and, in several instances, quite radical, as resulting, in great part from the speculative influences, which have been in substantial control of the Produce Markets....All kinds of Breadstuffs have been again advanced materially, through speculative action, which has carried prices relatively much above the current figures in the Foreign Markets, (though these have shown a steadily hardening tendency), thus seriously impeding the outward movement of Flour and Grain, and leading to a rapid accumulation of supplies at the seaboard, as well as at the principal points of the interior. Notwithstanding the unsatisfactory position of the export interest, the speculative demand has been gaining in volume, urgency, and confidence, especially within the past week or two, and the loss in values, of which mention was made in our last, has not only been recovered, but prices have been pushed decidedly ahead, on the upward movement, on excited markets, particularly at the extreme close, subject, of course, to sudden and, in instances, sharp reactions, partly due to sales to realize profits. Wednesday, December 10th, was marked by a rise from the preceding day in Wheat of 2@3 cts.; Corn, 1@2 cts.; Rye, 3 cts.; Oats, 1½@2½ cts., per bushel; Flour, 10@25 cts. per bbl., on very free dealings, in Wheat and Corn, and an active trade also in Rye, Oats, and Flour. The transactions in Wheat were mainly in Winter grades, chiefly in the grades of No. 2 Red, and No. 1 White, on speculative account,—the operations in No. 2 Red, for January delivery, alone, having exceeded, on the specified day, 900,000 bushels, opening at $1.61, rising to $1.62, and receding to $1.60¼ per bushel. Corn also met with unusual attention on that day, the reported sales having amounted to about three-fourths of a million bushels, of which amount about one-half was for prompt delivery, in good part for export. Of Wheat, shippers have been recently making the most important purchases of low grade, or ungraded stock, as being least affected by the speculative manipulation of values, which does not exceed much beyond No. 1 White, No. 2 Red, and the various classes of No. 2 Spring. On Thursday, Dec. 11, transactions in Wheat were again very extensive, having been, as reported, up to nearly two million bushels, (1,984,000 bushels), of which about 290,000 bushels were for prompt delivery. Most of the day's trading was again in the option line, and chiefly in Winter grades, of which, in No. 2 Red, the dealings reached 1,300,000 bushels, including for January delivery, 800,000 bushels. Prices fluctuated widely, the extremes for the day having been fully 3c. a bushel apart, but at the close the quotations stood, in most instances, ¼@1c. a bushel higher than on the preceding day. A freer export inquiry was reported, chiefly for No. 1 White for the Continent. Corn receded ¼c. a bushel, and Oats fell off 1@2c. a bushel, on a much lighter volume of business. Rye has become quite scarce for early delivery, giving holders the advantage in all current negotiations, the market winding up buoyantly. Barley opened very brisk at advancing prices, but has recently been in limited request, and somewhat irregular. Oats have been rising steadily, on a reduced offering and active inquiry....In the Provision line, Hog products have been remarkably active and buoyant, closing more or less unsettled. Beef and Beef Hams, firm, and in fair request. Butter and Cheese less sought after, the former yielding in price. Eggs also weaker....Seeds have been without important alteration, and have been, as a rule, quiet, strictly prime to fancy Clover Seed having been the notable exception as in fairly active demand ...Hops have declined considerably, as influenced by the falling off in the export call, and the accumulation of stock here....Hay and Straw have advanced, and have been in good request, with comparatively moderate supplies available ...Wool has been more sought after, and has been quoted higher, closing generally strong in price, on much lighter offerings....Cotton has been decidedly buoyant, on a brisk movement, mainly speculative....Groceries have been attracting less attention, and prices have been quoted weaker....Hides and Leather, again dearer, and in light stock....Naval Stores and Petroleum less active, and unsettled....Metals, Hardware, and Boots and Shoes, less freely dealt in. Iron and Iron products weaker in price ....Dry Goods, on the advance in nearly all instances, and remarkably active for the season....Ocean freights have shown much less animation, and rates have declined materially....The closing of inland navigation has cut off one important source of supplies of produce for the winter, the great trunk railways being now the chief reliance of our merchants for the current movement of bulk freight to the seaboard. At the extreme close, the freight market was further seriously depressed, the rates on Grain, hence by steam to Liverpool, (Dec. 11), having fallen to 4c. per bushel, and by sail hence to Cork, for orders, to 5s. per quarter, and for Provisions, by steam to Liverpool, to 22s. 6d.@30s. per ton.

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Nov. 17	8,358	255	1,684	21,389	46,647
Nov. 24	11,229	211	1,462	41,638	37,613
Dec. 1	12,499	467	2,093	32,259	53,728
Dec. 8	8,980	325	1,336	28,340	44,373
Total for 4 Weeks	41,066	1,258	6,575	123,626	182,361
do. *for prev. 5 Weeks*	63,683	1,371	16,238	191,413	221,243

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	10,266	314	1,643	30,906	45,590
do. do. *last Month*	12,736	272	3,251	39,443	44,248
do. do. *prev's Month*	11,972	226	4,209	33,027	32,892

Prices for beeves the past four weeks were as follows:

WEEK ENDING	*Range.*	*Larger Sales.*	*Aver.*
Nov. 17	6 @10 c.	7½@ 9½c.	8½c.
Nov. 24	6 @10¾c.	8¼@ 9¾c.	9 c.
Dec. 1	6¼@10¾c.	8 @ 9½c.	8¾c.
Dec. 8	6 @10¾c.	8¾@ 9¾c.	8¾c.

Beeves.—The month's business opened briskly, with a decided advance in prices, and became stronger as the weeks elapsed. An advance of ¼c. ₱ lb, and the expectation of higher prices unfortunately tempted shippers to overshoot the mark, and, by crowding the market, tumbled prices down again, causing heavy losses. $50 a car load was the figure of the loss to many, and a dull feeling prevailed up to the close; when an effort to put up the market failed, and prices remained stationary at 2½@3¼c. ₱ lb, live weight, for coarse oxen and dry cows; 7c.@8¼c. ₱ lb for poor to fair steers, to dress 55 to 56 lbs; 9c.@10¼c. ₱ lb for good to choice to dress 56 to 57 lbs, and 10¼c.@10½c. for selected steers on 57 lbs. estimate. Exports have been brisk; the last week 250 live cattle, 8,627 quarters of beef; 2,150 dressed sheep, and 175 dressed hogs were shipped....**Cows.**—The demand has been unusually strong for cows, and a gradual advance in prices has taken place, which the unusually heavy receipts in one week of nearly 500 head did not check. Good cows are now worth $60 per head, and extra have sold at $70. The range may be quoted at $45 to $65 per head for fair to extra ...**Calves.**—A steady business, with an even demand, has kept the market in good condition. Firmness, at full prices, may be said to mark the trade, for no quotable advance has been made during the month, yet the seller has been favored more than the buyer. Grassers have been steady at 2½@3c. ₱ lb alive; choice calves have sold as high as 3¼c. ₱ lb. Fed calves have brought 3¼@4¼c. ₱ lb, and veals 4½@7½c. for common to choice....**Sheep and Lambs.**—The market for sheep has been brisk, and prices have gradually strengthened, closing at 3½@5¼c. ₱ lb for poor to choice. Some heavy Kentucky sheep, average 157 lbs., sold for 6c., the highest price for more than 6 months. Lambs have been less active, and 5@6½c. has been paid for common to extra....**Swine.**—A brisk market and somewhat higher prices are to be noted, at the fore part of the month, with a fall of ¼c. ₱ lb towards the close, when a firmer feeling was exhibited, and prices advanced ¼c. ₱ lb to 4¼ and 5c. ₱ lb.

Horse Market.—Few horses are selling at present. The best indication of the condition of the horse market is the fact that dealers have shipped largely to Europe, 50 animals having been sent to Antwerp by one steamer. These were fine coach horses, and taking into account the risk of shipping valuable animals at this stormy season, it shows clearly that the home market has been without any life. One thing to be considered is, that the summer's business has cleared off most of the good stock, and there are few left in breeders' hands, so that while sales are few and far between, prices remain stationary. A few work horses are always called for to fill vacancies, and just now this is all that is doing.

Prices of Feed.

Bran, per ton	$16.00@$18.00
Middlings, per ton	19.00@ 20.00
Ground Feed, per ton	21.00@ 23.00
Linseed-oil-cake, per ton	35.00@ 40.00
Cotton-seed-meal, per ton	26.00@ —
Chandler's Scraps, per lb	2@ 3

Prices of Fertilizers.

Nitrate of Potash (95 per cent.), per lb	9 @9¼c.
Sulphate of Potash (potash 44 per cent) per lb	3½@4 c.
do. do. (potash 27½ per cent) per lb	1¼@1¾c.
German Potash Salts (potash 12 to 15 p. c. p. ton	$15.00@18.00
Muriate of Potash (potash 50 per cent), per lb	2 @2½c.
Nitrate of Soda, per lb	4¾@5 c.
Sulphate of Ammonia (25 per cent.), per lb	4c.@4½c.
Dried Blood (ammonia 13 per cent) per ton	$40.00@45.00
No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ₱ ton	$56.50
do. do. Lobos, do. do. do	47.50
do. do. guaranteed, ₱ ton, cargo K	56.00
do. do. rectified, per ton, 9.00 p. c.	65.00
do. do. do. do. 3.40 p. c.	51.00
Soluble Pacific Guano, ₱ ton	45.00
Excelsior Fertilizer Works, Fine Ground Raw Bone	55.00
Mapes' Complete Manure (clay soils) per 1,000 lbs	25.00
do. do. (light soils) per 1,000 lbs	25.00
do. do. do. "A" Brand, (wheat) ₱ 1,000 lbs	30.00
do. Bone, strictly pure, meal per ton	42.00
do. do. do. medium do.	36.00
do. do. do. dissolved do.	42.00
do. Fruit and Vine Manure do.	35.00
Stockbridge Rye Manure, per ton	45.00
" Wheat do do	45.00
" Seeding Down Manure, per ton	40.00
Bowker's Wheat Phosphate, per ton	40.00
Baugh's Raw Bone Phosphate, per ton	38.00
Baugh's Manure for Tobacco and Grain, per ton	45.00
Walton, Whann & Co.'s Raw Bone Phosphate	40.00
Gypsum, Nova Scotia, ground, per ton	7.50

Home Made Bone Fertilizer.—"W. S. S." In some localities, which are distant from markets or

large towns, it may be found convenient for farmers to do the best they can to procure waste bones, and reduce them to a condition for use by means of wood ashes, as was explained in the *American Agriculturist* for Nov., 1879, (page 477). But where manufactured bone dust, or other bone fertilizers can be procured, it will certainly not pay for farmers to spend money and time in the disagreeable and slow process of thus reducing bones for use. Their money may be better used in purchasing the more effective fertilizers, and their time in doing more valuable work. The hints given to a correspondent last month, were not intended to be of general application, as W.S.S. and some others have supposed, but only to apply to special cases, where raw bones were easily procured, and the manufactured bone was not.

Balky Horses.—After long coaxing, with no little use of the whip, we have seen a balky horse started by putting a lump of earth in its mouth. The mind of the animal seems to be set on not going, and the point to be gained is to divert it from the idea entertained, and this the earth in the mouth does effectually. So soon as the horse gives its attention to the getting of the earth out of its mouth, it forgets its balkiness and can be started.

Keeping Butter with Borax. — The Italian Minister of Agriculture gives an account of experiments which have been made at the Experimental Station at Florence, to the effect that Butter, purposely not freed from buttermilk, kept perfectly sweet for upwards of three months by the addition of about eight per cent of Borax. It is stated that the Borax should be dry, in fine powder, and thoroughly mixed with the butter. A friend of ours is experimenting with both Borax and Boracic Acid, in butter,and will in due time report results.

The Gardens and Conservatories of California, is the title of a series of articles by Mr. Shinn, the Editor, the first of which appears in the "California Horticulturist" for November. This article is illustrated by a full-page photograph of the residence of A. K. P. Harmon, of Oakland, giving the house, grounds, and a large conservatory. A comparison of this fine place with our recollection of a visit to Oakland, shows that twenty-five years must have brought wonderful changes in what was then a very rude suburb of San Francisco. But this is not more wonderful than that San Francisco should publish the second Horticultural journal of the country—our old friend the "Gardener's Monthly" being the first. More wonderful still is the fact that for our third horticultural journal, we must still go to the Pacific coast, where the "Southern California Horticulturist" is doing most excellent work for its favored locality. We use first, second, and third, with reference to duration, not to indicate order of excellence, which we should not attempt where each is so good in its place.

The 10th Duchess of Airdrie, owned by Hon. Mat. Cochrane, is one of the most remarkable cows on record. She has just given birth to her ninth calf; the "8th Duchess of Hillhurst." Of the 10th Duchess and her daughters, Mr. Cochrane has sold several animals at the price named: "4th Duke of Hillhurst, $7,000; "5th Duke of H." (2 months old), $8,000; "Duchess 5th" (8 months old), $18,000; "Duchess 2d" (cow), $21,000; "Duchess 3d" (heifer), $23,600; "6th Duchess of H." (heifer), $12,000; "3d Duchess of H." (heifer), $20,500; "5th Duchess of H." (heifer), $21.500; a total of $131,600 for the eight animals. The 10th Duchess, Airdrie Duchess 4th, and the 7th Duke and 7th and 8th Duchesses of Hillhurst are still in Mr. Cochrane's possession, valued at $116,000. Grand total from the "10th Duchess of Airdrie," $247,600. Not a small sum for one cow.

The Rennet Plant.—A friend writes from Idaho that he has heard of a plant growing in New Mexico that is used in cheese making for the same purpose as rennet. Will some of our subscribers in New Mexico tell us what this plant is, or, if the botanical name is not known, send a specimen, that we may determine what it is?

Hop Culture. — "H. D. M.," St. Louis, Mo., asks a series of questions which would require a treatise to answer in full. Perhaps an answer to the first may make a reply to the others unnecessary. He asks: "Can Hops be grown to advantage on a wet, mucky soil, not springy, but a marsh, subject to overflow in winter or spring?"—Most decidedly not. The first requisite in Hop culture is a dry warm soil, if at all retentive of water the plants will soon die out. It would be a waste of labor and a useless expense to set a hop-yard on such soil like that described.

Value of Fodder Corn.—The experience of the past season has given the writer a highly favorable opinion of fodder corn. A number of cows kept for milk have been steadily fed from July until frost upon fodder corn, with the addition of four quarts of meal daily. The ration has been 90 lbs. in three meals of 30 lbs each. The first feed was given at 6 o'clock in the morning, cut up in a fodder cutter, wetted with water in which malt sprouts had been steeped for 12 hours, 2 qts. for each cow, and sprinkled with 2 quarts of meal of corn, oats, and wheat-middlings ground together; the second at noon, given whole, and the third at 6 o'clock in the evening, cut as in the morning, but without any malt-sprouts and with 2 qts. of meal, mixed with it after wetting it with water. Upon this feed the cows have kept up their usual flow of milk and in good condition, and have done as well as when fed upon green clover or grass. The corn was sown with the Albany corn planter in drills 3 feet apart and 3 inches apart in the drill. Five feet of row produces 30 lbs. of fodder, or 2 lbs. to the square foot, or 43 tons to the acre, the corn being about 8 feet high and having a good many half-grown ears here and there. One acre of such corn is thus able to support 40 cows 13 days, or 12 cows for 40 days; but this is only when fully grown, as it was when these weights and measures were made. Half of this estimate would be fair, considering that the feeding of the fodder usually begins when a part of the field is only half-grown. It may be gathered from these facts that there can be no more valuable fodder crop grown for late summer and early fall feeding than fodder corn. This experience is corroborated by that of many other dairymen and farmers, but it is worth noting that there is a difference in fodder corn which may well account for the various opinions regarding it. There is that which, sown broadcast and being too much shaded from light, is without color or substance, and makes very poor feed; and that, on the other hand, which having been grown in rows and exposed to the light is more solid and the juices are more mature and perfect. The latter kind is that which satisfies those who use it, and the former is that of which so many complaints have been made, and doubtless with justice, and which have given fodder corn a bad reputation with those farmers who had rather give heed to what they hear than try experiments for themselves.

An active Farmers' Club is that of Oxford, O., of which the Rev. James McGregor is President, and Miss Virginia Dare, Secretary. The meetings are held monthly, at the residences of the members, and the programmes for all the meetings of the year are neatly printed beforehand. The programme is not a mere statement of the topic, but gives a digest of sub-topics, and persons are appointed to speak upon these. The programme for this month will give an idea of this complete and excellent arrangement: "January 2, 1879. 10 A.M. The Club will meet at the residence of Mrs. E. S. B. *Topic.*—Wastes of the Farm and Household. *Sub-Topics.*—1. Waste Lands in Fence Rows; Sprouts; Washes; Knolls, etc. Opened by Mr....2. Wastes in Keeping and Management of Horses, Brood Mares, and Colts....3. Wastes in Keeping and Management of Cattle, Cows, and Calves....4. Wastes in Breeding, Feeding, and Management of Swine and Sheep....5. Wastes in Machinery, Bad Buying, and Poor Care....6. Wastes in Harvesting and Storing Crops, Corn, Grain, and Roots ....7. Wastes in the Kitchen. Mrs. ——, (this and the following are assigned to ladies)....8. Wastes in Amount and Kinds of Food....9. Wastes in Heating and Cleaning the House....10. Wastes from Irregularity and Want of System." This club means business.

Seedling Peaches. — "P. S. T.," Spring Creek, Va. Has been told that seeds from budded peaches would not come up.—Which is nonsense. Has been told by others that the seeds would produce such fruit as the tree would have borne had it not been budded. This is another error. No one can foretell what kind of fruit a peach seed will produce, but it is more apt to have fruit like the tree which bore the seed than will other cultivated fruits. Some varieties of the peach reproduce themselves from the seed with great regularity; with others it varies, being either poorer or better than the parent tree. To be sure of the variety, we bud.

Buying Tools.—The winter is the time to buy tools. Every farmer should, at this season of the year, determine what implements he will need for the next year, and make arrangements for procuring them. If a mowing machine is to be bought, let him take time by the forelock, and look into the merits of each kind of these machines, and buy intelligently; do not wait until the grass is ready to cut, and rush and buy the one nearest at hand. By sending to the various manufacturers, circulars with full directions, and illustrations, can be obtained, together with prices, etc. If a plow is needed, do all the work of selecting it, before the busy season is at hand, that it may not be "on the way," just when the best week for plowing is passing. In the peace of winter, prepare for the war of summer.

Sewing Machines.—The largest sewing machines now in use weigh 800 lbs., and are employed in carriage manufactories for doing the stitching of the leather, as upon the dasher and other parts. These large machines are as perfect in their action as the small, family ones, and accomplish in a few minutes what would require hours to do by hand, and do it in a superior manner.

The Vandal of Laurel Hill.—At Laurel Hill Cemetery, in, or near, Philadelphia, there were two Cedars of Lebanon, each some 50 feet high, and well known to lovers of trees as among the finest specimens of this Cedar in the country. We learn from a late "Gardener's Monthly" that one of these trees were cut down! And why? Because the tree was in the way; it interfered with the reading of the inscription on some paltry gravestone or monument! We say "paltry," with no reference to the particular handful of dust that the stone may for a few years mark, but *any* monument whatever, by the side of such a tree, is a miserably paltry affair. A few dollars and a few day's work may restore a gravestone or a monument—whatever lettering there may be, of no possible use to the dead, and only flattering the vanity of the living who put it there—could be easily replaced. But that tree! The miserable marble thing of to-day would sink into utter insignificance before *any* tree 50 feet in hight—but before a Cedar of Lebanon of 50 feet, before any Cedar of Lebanon, how miserable paltry seems any work of man. It is well to be charitable, and assume, difficult as it may be, that this person knew no better. Could he have known that the very ancestors of this tree are now regarded as among "the most renowned natural monuments of the universe;" that they furnished Solomon wood for the Temple; that this very tree descended from those mentioned all through Sacred History; had he known that to this day even the Arabs hold the ancestors of this tree as sacred, could he have cut down a Cedar of Lebanon, as if it were a used up telegraph pole? This tree would, no doubt, live for centuries after the elements had obliterated the letters chiselled into the slab or monument, centuries after the miserable piece of carbonate of lime had crumbled away, centuries after the memory of the dead whose monument was to be preserved, and centuries after the memory of the preserver of the monument had passed away, would this Cedar of Lebanon have stood, and been an object of interest and admiration—but it was in the way of somebody's head-stone, and was cut down!

Fresh Air for Fowls.—In protecting poultry from the cold, do not shut them up so closely that they can not get a sufficient amount of pure air. Ventilate the fowl house, otherwise the fowls will sicken. Feed well, and in winter mornings give a warm mess.

Farmer's Clubs are now holding their meetings in various parts of the country, and if properly conducted, much information can be thus exchanged. The social aspect of these gatherings is not to be overlooked, in estimating the good such gatherings do. At best, the farmer's life is a secluded one, but not therefore to be considered dull and monotonous. Farmer's Clubs tend to make good neighbors, in more than one sense.

The Importation of Plants.—Whoever has been so unfortunate as to have a friend abroad send him a present of a box of living plants, will, after his experience, be ready to join the free-traders and declare against all duties, so far as plants go. We find that the dealers in plants are also desirous that the duty be abolished. To them the importation of plants is like the importation of raw material; they only get from abroad a stock from which to propagate, and the case is exactly parallel to an impost on the crude stuff in manufactures, the raw-material of which is not, and can not be, produced at home. But aside from this, the delays, which in the routine of the Custom House seems to be unavoidable, are such that if plants reach the port in fair condition, the time that must elapse before the owner can get possesion of them is the death of a large percentage. A ridiculous feature in the law is, the duty on common roots is 20 per cent., while if the plant is unfortunate enough to have a bulb at the base, Uncle Sam wants 30 per cent. If our beloved Uncle will make this nice distinction in the duty, he should have officers who can make the distinction in the plants themselves. A friend of ours recently had a box come over, which in the routine of the Custom House was appraised and the plants therein were appraised as bulbs; none of the plants therein had bulbs any more than a cabbage has, but the United States Government, through its sworn officers, said they were bulbs. It now becomes a delicate question; if these plants, which the highest authority have pronounced to be bulbs, should grow and still produce common roots, are they not guilty of constructive treason, and is not our friend an aider and abetter? Why not be done with at least this much of nonsense. If plants are to pay a duty why not have it uniform-alike for all; this would avoid the overhauling of the plants by persons who do not know a bulb from "a permanently abbreviated, tunicated, subterranean stem". Duties on plants are a serious drawback to horticulture, and help only foreign growers.

The Food Supply of England.—A correspondent, "J. B. C.," in N. S. Wales, criticises an article, published in Sept. last, in which we suggest that England must in future draw largely upon this country, for her supplies of grain and meat, and that in this trade, we are likely to be without competition. He thinks that were we to give up grain growing, and take to grazing, we might successfully compete with the English farmers in meat, but he suggests that in wheat the Australian colonies are about to enter the field as competitors. He says: "For wheat growing, we have the soil and climate, and we only require to take advantage of these two grand helps. This we seriously expect to grapple with, on a more extended scale ere long." In the matter of meat supply, he is equally confident, and says that next month they will send their first shipment, protected by some one's "process," and "hopes for great success." In our article, we had in view European competition. Our Australian friend's wheat, according to his letter, is yet to be raised, and his meat is yet to be shipped. When these reach the market, if the American farmer can not successfully compete with the Australian in meat and wheat, he (the American) will do something else. In the meanwhile, we shall remember a homely proverb—"Its the longest pole that knocks down the persimmons."

Osage Orange Hedge.—"T. D. H.," Russell Co., Va. The Osage Orange is almost universally raised from seed. Plants may be grown from cuttings, but at a vastly greater expense, and not be so good as seedlings. The seed is not usually on sale until February and March. This is to be sown and the plants grown the first year in a seed-bed, never in the place where the hedge is to stand. Seed is sown as soon as spring is fairly opened, it being first sprouted by keeping it moist in a warm place for a few days. Hedge plants one-year-old can be had at a very low rate; by purchasing these, a year will be gained in the growth of the hedge, and all trouble of seed-sowing and future care of young seedlings avoided. Your other questions are answered in Notes About Work.

A Submerged Pump. — Theoretically a pump should raise water by atmospheric pressure, ("suction" as it is often called), for about 33 feet. But owing to imperfections in our pumps, it is rarely that they can be depended upon to, raise water directly, for over 25 feet. As the majority of wells are of a greater depth than this, numerous devices have been resorted to in the construction of deep-well pumps. One of the most efficient pumps of this kind is a force-pump, placed completely under water, where there is no appreciable loss from the leakage of air or water. By an ingenious contrivance of levers, the motion is imparted to the pumps placed below the surface of the water, and it gives a full and continuous stream, thrown with great force. We had one of these pumps in use for several years, during which time it kept in perfect order, and worked to our entire satisfaction; its use was only discontinued on account of being obliged to abandon the well. The fact that the American Submerged Pump, the kind to which we have reference, can not freeze is not a small point in its favor.

Further Household Notes.—(*See p. 23, etc.*)

Short Notes on Air.—At the freezing point, water is 770 times *heavier* than air; but heat expands air, making it lighter, so that at a temperature of 60° it is 815 times lighter than water....At the medium temperature of 60°, with a barometric pressure of 30, every 100 cubic inches of air weigh about 31 grains, and every 13 cubic feet of it weigh a pound. The air in a room 20 feet square and 10 feet high, weighs 306 lbs. avoirdupois, and a 31-gallon barrel full weighs just about 5 ounces....From the freezing point (32°) air expands $^1/_{493}$ of its bulk for every degree of added heat shown by the thermometer. ....At the surface of the earth, the pressure of all the air above is equal to about $14^3/_5$ lbs. upon every square inch, or 2,105 lbs. upon every square foot (over a ton!)..... Higher up there is less pressure of its own weight, and it is expanded or rarified, so that at the hight of about 2¾ miles (2.7) it is only half as dense as at the earth's surface, and it takes 26 cubic feet to weigh 1 lb. At the hight of $5^2/_5$ miles, it has only one-fourth of its density at the earth's surface, and 52 cubic feet weigh only a pound.... The pressure of the air upon water at the earth's surface is so great that it only boils when heated up to 212°. But as the pressure higher up is less, water boils at 1° less of heat for about every 550 feet we ascend. At ½ mile high, water boils at 207°; one mile high at 202°; two miles high at 193°; three miles high at 183°, and at this temperature the boiling water is hardly hot enough to cook potatoes. The air grows less and less dense until at about 45 miles high there ceases to be any air at all, it is supposed—only vacant space....An important property of air is that as it becomes warmer it absorbs water or vapor of water, and *hides it within itself*, so to speak; as it cools it gives out this water again. The air in a room 20 feet square and 10 feet high, when heated from 32° to only the temperate heat of 70°, secretes within itself $3^1/_8$ pints of water. A current of warm air when cooled by any means, as by meeting a current of cold air, gives out its secreted moisture; the little water atoms given out become visible in the form of clouds, and when there is much water thus let loose the little drops keep uniting until so heavy as to fall down as rain. So the warm air gathers up from the earth's surface myriads of watery particles, carries them heavenward hidden unseen in its vast storehouse, until it chances to be cooled, and then it drops the particles back in rain—or in snow if it is cold enough to freeze the falling drops.

Dampen the Air Now.—We can hardly too often suggest the importance of providing ample moisture in all rooms heated by stoves, furnaces, steam pipes, or hot water pipes. There are sound scientific reasons for this, as well as in the results of practical experience. As stated in "Short Notes on Air" above, every degree of heat added to the atmosphere in a room gives it a power of absorbing and *secreting* moisture. The air in a room 20 by 20 feet and 10 feet high, at 32°, holds, secretes, about 1¼ pints of water. The same air heated to 70°, secretes upwards of *two quarts* of water, and unless this is supplied, it is hungry for more water, absorbs it from every accessible source, from the furniture, from our bodies, and especially from the breathing organs—the mouth, throat, and lungs, leaving them dry and husky. Therefore, every time the air in the room is changed by the admission of fresh, cold air, and heated to 70°, two quarts of water should be evaporated into the room. The strong objections some have to warm-air heaters have arisen mainly from this cause. In using furnace heaters we always put into the hot-air chamber extra water-pans besides any that are supplied by the manufacturers, and take good care to always have them filled with water. In stove-heated rooms there should usually be an evaporating surface of water equal to one square foot for every 12 feet square of flooring, and more if the water is not on a hot place enough to keep it rapidly evaporating. Plants in a room are mainly destroyed, or have a sickly growth, because the warm air becomes too dry and sucks out the very juices of the plants. The "house plants"—"olive" or otherwise—suffer similarly. In a warm room, a large towel frequently wet and wrung so as not to drip, and hung over a rack or chair back near the stove, will make a marked difference in the comfortable feeling of the atmosphere and in its healthfulness.

Macaroni—Vermicelli—Sea-Biscuit—Pilot Bread—Plain Crackers, and Common Bread, are all about alike, in *composition* and *nutriment*. Macaroni and vermicelli differ only in the size of the tubes, both being made alike, and both are simply dried dough made of flour and water only, the same as pilot or sea-bread and plain crackers. The wheat grown in southern Europe contains more gluten and less starch than any other, and therefore makes better macaroni. This gluten is nitrogenous, like lean meat, casein or curd of milk (cheese), etc., and strengthens one's muscles more than the more starchy northern flour. Starch is carbonaceous, supplying material for producing fat and for promoting warmth in the system. Millions of people in Italy use macaroni as their chief, if not sole food the year round—the gluten answering for the lean meat consumed by other people to produce muscular strength or working power. Sea-biscuit, Pilot bread, and plain crackers, those without the "shortening" of butter or lard, are simply flour and water, worked into tough dough and baked instead of being air or sun-dried as macaroni and vermicelli are. They are usually made of northern grown wheat, containing more starch and less gluten than macaroni.

A Nice, Light, Toast Lunch.—It often happens that after a late heavy dinner, or when arriving home late in the evening, or when one is an invalid, or dyspeptic, and especially when a troublesome tooth or other mouth ailment prevents proper mastication of harder food, one wants a light, easily digestible and easily masticated dish or lunch. Well-cooked oatmeal, the grains nearly whole and not "all in a mush," is quite good, but is not always accessible, and is not liked by all. Latterly we have found the following very good, especially for a late supper or lunch, eaten only an hour or two before retiring: Toast some slices of bread pretty well, scraping off any blackened, charred portion; lay the slices on a plate, preferably a soup-plate, and pour on cold milk enough to wet it through, and leave half an inch or so in depth of milk in the plate. Good milk; a little extra cream in it is all the better, and a very trifle of salt improves it for our taste. Put over the toast thus prepared an inverted large earthern bowl, or tin basin, large enough to cover it and set down upon the plate all round. Put this in a warm, not very hot, stove oven, two, three, or more hours in advance. The milk will cook and evaporate—and its substance be condensed in the toast, while the cover will keep the toast moist. It is then very good, and eats well without butter, though a little may be applied if desired.

Speaking of Toast, comparatively few know what really good toast is. A hasty singe of one or both sides does not make toast; nor do thin slices of bread dried through. Cut slices of uniform thickness, a plump half inch or ⅝ths inch: move around over a brisk fire, to have all parts toasted alike; keep only so near the coals that the pieces will be heated through when both sides are well browned. If the slightest point is blackened or charred, scrape it off, or it will spoil the flavor of the whole. If covered with an earthen bowl, it will keep both warm and moist. A clean towel or napkin will answer if it is to go at once to the table. But, nobody can make good toast out of poor bread. Stale bread may be used for milk-toast, sour bread may be improved by toasting it through; heavy bread makes poor toast. Sweet, light bread, only a day old, or less, makes the best toast. For older bread and scraps see the next item.

"Rusk," was the old farm name for what is a palatable preparation of stale and dry bread. Save all pieces of dry bread, loaves too dry to be longer palatable, crusts, etc. Put all together, first carefully sorting any mouldy bits, and any burnt crusts. Bake or dry thoroughly in an oven until well browned—not dark-brown or coal blackened, a dark-buff-brown is best. This will keep a good while. When wanted for use, crush finely with a rolling-pin or otherwise. To be eaten in milk, of which it will absorb a large quantity. It is not only nourishing dish, but makes a good disposition of much dry and stale bread that would otherwise be wasted.

A Good Soft Ginger Cake.—Take 1 cup of Molasses; half cup of Butter or Drippings, 1 cup boiling Water; 1 teaspoonful of Cooking Soda: and half teaspoonful of good ground Ginger. Mix soft, bake quickly.

To Fry Fresh Fish, so as not to absorb the fat, or destroy the delicate flavor of the fish, is quite a desideratum. A Lady who has attended Miss Corson's practical Cooking Lectures, contributes the following to the *American Agriculturist*—derived partly from Miss C.'s advice, and partly from her own experience. Small fish are to be fried whole; large fish have the fleshy portions cut off with a very sharp knife, and divided into strips (fillets) of a convenient size for serving. When cleaned and ready for cooking, wipe dry, and roll them in powdered cracker or bread crumbs. (Cracker, ready pulverized, is now sold at most grocery stores, under the name of "cracker dust.") Dip the fish, or pieces, in well-beaten egg, and again roll them in the cracker dust or crumbs, removing any lumps so as to leave the surface smooth. Have the fat hot, and drop in the pieces, watching them carefully until they cook to a golden brown; then lift from the fat and lay upon thick paper to absorb the fat. Fillets of fish with the bones in, may be treated in the same way. By this method the fish are well flavored and much more digestible for weak stomachs. Fish are nourishing, and not only supply good food for the muscles, but also furnish good brain material.

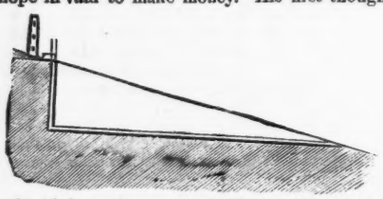
Oysters and Clams, and Meat Croquettes (balls or cakes) are best fried as above described for fish. The egg and cracker or crumbs retain their flavor, and keep out the frying fat. Placing on brown paper to remove the surplus fat is an important part of the process.

Putty in Tasmania. — There is no part of its world-wide domain in which the *American Agriculturist* meets with more appreciation than in Tasmania and Australia. In return for the many "Hints and Helps" we have given our Island friends, we are glad to occasionally receive some in return. A friend writes from Hobart Town, Tas., that having to reset some 18 squares of glass, he found the old putty, which had been in place for several years, very difficult to remove without injury to the sash. A fellow mechanic suggested the following method: "Take a heated iron, a soldering 'iron' (which is copper) is the handiest, and run it over the putty that fastens in the glass; in a few seconds it will be found that the putty, though before so hard as to require a sharp blow to take any effect upon it, will become so soft as to be removed with a common pocket knife." — Our far off friend says: — and we commend his saying to those near at hand as well as at a distance — "I often think that simple common things are not communicated as they should be, as persons mistakenly suppose that others know such matters as well as they do themselves." —The simplest devices are often the most useful.

Delaware Co. Dairymen's Association held its regular fair in Delhi, N.Y., Nov. 12—13. From the report sent us by the Secretary, together with the list of premiums awarded, it is evident that the show was a large and successful one.

The Treatment of Manure in Winter.

How can a farmer make money? Only from large crops cheaply grown or from animal products cheaply procured. How can large crops be cheaply grown? Only by means of abundant manure and good cultivation; the one being unavailing without the other. Then it comes, after all, to this: that if a farmer would make money, the size and quality of his manure pile is the exact complement of his profits from his crops; and without manure he may hope in vain to make money. His first thoughts



and chief employment at this season must be directed to making a supply of manure for next year's crops. It is better late than never, and though it is now late, thousands of farmers who have not yet begun, may yet do something towards securing a stock of manure for use in the spring. One of the most important parts of the work is, to provide a proper receptacle for the manure. An open yard from which the water drains away in all directions is the poorest place for manure making; and yet in such a yard an excellent manure pit may be made. We had recently the opportunity of showing a neighbor how to make such a pit, which was done at little expense, at the side of his yard, and we now see him every day hauling load after load of stuff into the pit to make a rich compost. The yard sloped considerably on one side towards a road. A pit 20 feet in length was dug in this bank with the bottom sloping backwards, and somewhat lower at the rear than the front. The pit was 16 feet wide and 8 feet deep, at the rear end. A fence was made around it on the yard side with a set of bars, so that the contents of a cart could be tipped into the pit. The shape of the pit is shown in the engraving. The pit was half filled with leaves from the woods, sods, and muck from a swamp, coarse manure from the yards, sods from the road sides, which were plowed and cleared for this purpose, yielding a large quantity of material. Then the manure was thrown into the pit and the yard was furrowed so that the rain water which usually gathered in the center of it, should run into the pit and keep the manure moist. The pit was made in October and in about one month was nearly full. Before it was started the farmer thought it would be foolish to make it, as he could never fill it. But one can never know what he can do until he makes an attempt. There is yet time to do a great deal in this way before spring, and if nothing but leaves are raked up in the woods to make an absorbent foundation for the pit, much may be done with them. It is necessary to have a good layer of stuff in the bottom to hold all the moisture of the manure, and if there is danger of over-heating, water may be hauled and poured on to the heap, unless there is some more ready method of applying it.

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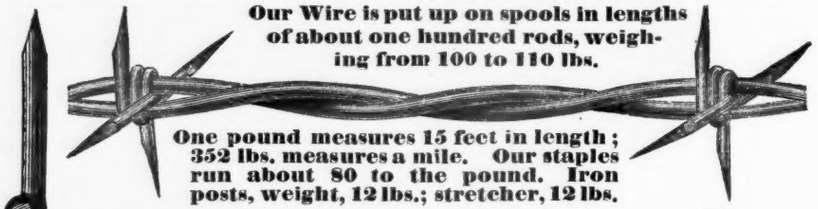
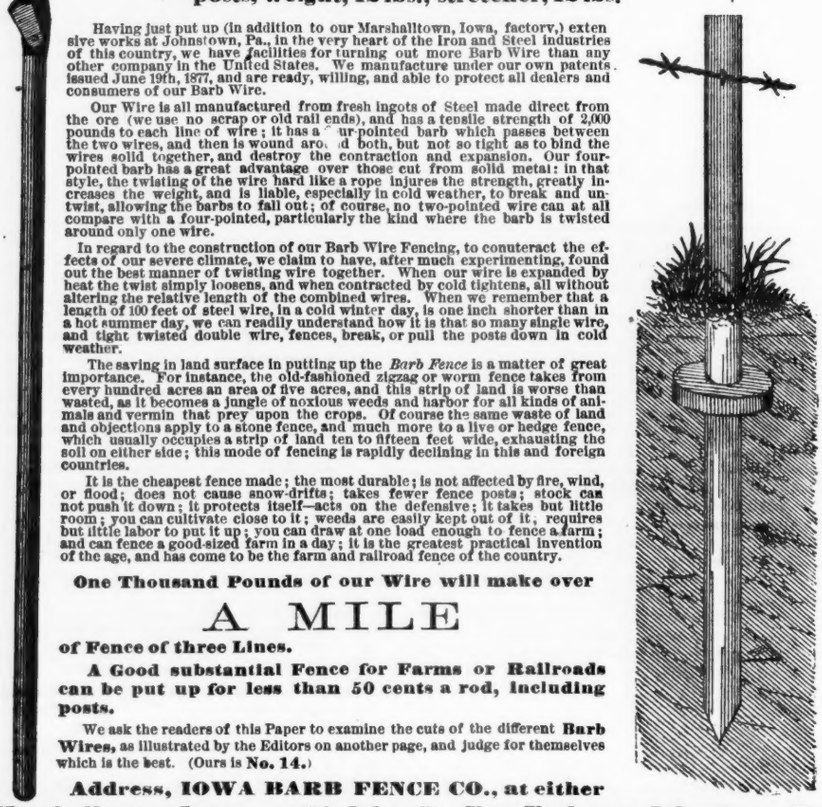


One pound measures 15 feet in length; 352 lbs. measures a mile. Our staples run about 80 to the pound. Iron posts, weight, 12 lbs.; stretcher, 12 lbs.



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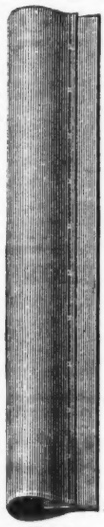

Fig. 1.

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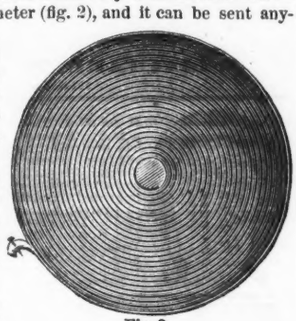

Fig. 2.

It costs only 4 cents a foot for Window size, and 5 cents a foot for Door size. Having tested its utility and convenience by a trial of it this winter, we have, for the convenience of the Readers of the *American Agriculturist*, arranged to supply any orders sent to this Office, for coils of 25 or 50 feet each, at **five** cents per foot for the Door Strip, or **four** cents per foot for the Window Strip. It will be sent by express unpaid, or be forwarded by Mail to any part of the United States on receipt of **half a cent per foot** extra for pre-payment of postage.

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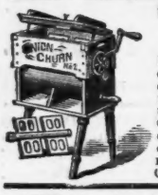

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